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ENTRIES 1–1085

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Vol. V AUGUST, 1920 No. 1

ENTRIES 1-1085

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

1. ANONYMOUS. **Electricity in agriculture.** Sci. Amer. Supplem. 88: 269. 1919.

2. ANONYMOUS. **The value of lupins in the cultivation of poor, light land.** Sci. Amer. Supplem. 88: 265. 1919. [Abstract of paper read by A. W. OLDERSHAW before Agricultural Section, British Assoc. Adv. Sci. Reprinted, *Ibid.* 88: 321. 1919.

3. ANONYMOUS. **Rispentypen des Hafers.** [Types of oat panicles.] Illustrierte Landw. Zeitg. 39: 87. *Fig. 68–72.* 1919.—This article is taken from the book entitled "Der Hafer" by Adolph Zade: Jena, 1918. Five different types of panicles are described and illustrated: 1. Stiff or vertical panicle. 2. Loose or hanging panicle. 3. Bushy panicle. 4. Spreading or open panicle. 5. Flag-shaped panicle.—*John W. Roberts.*

4. ANONYMOUS. **Kartoffelanbauversuche in der Schweiz.** [Potato culture experiments in Switzerland.] Illustrierte Landw. Zeitg. 39: 97–98. 1919.—Two portions of a field were planted to potatoes. In one portion the cut surface of the tubers was placed downward, in the other it was placed upward. Each portion of the field was divided into four plats according to the portion of the tuber used in planting: 1. "Kopfe." 2. Tubers cut into halves longitudinally. 3. Entire tubers. 4. Eyes cut out from tubers. For each plat, the weight of the seed potato, the total crop, and the proportion of weight of seed potato to weight of yield are given. The position of the cut surface made no difference in the yield. There was little difference in the yields from plats 1, 2, and 3; a good yield was had from all three. In proportion to the weight of the material planted, the yield of plat 4 was the highest of all, but the yield was not sufficient to make proper use of the ground. Experiments to determine proper plant spacing are also given.—*John W. Roberts.*

5. ANONYMOUS. **Seed importation act defined.** Seed World. 6^{12}: 20. 1919.

6. ANTHONY, STEPHEN, AND HARRY V. HARLAN. **Germination of barley pollen.** Jour. Agric. Res. 18: 525–536. *Pl. 60–61.* 1920.—See Bot. Absts. 5, Entry 949.

7. BARBER, C. A. **The effect of salinity on the growth of sugar cane.** International Sugar Jour. 22: 17–18. 1920.—From experiments carried on at the cane breeding station at Coimbatore it was found that common salt in the soil seriously affects the sprouting of sugar canes; the color of the leaves is rarely good; and the growth is stunted.—*E. Koch.*

8. Becker, Josef. **Versuche zur Unterscheidung landwirtschaftl. Sämereien und Futtermittel mit Hilfe der Serumreaktion.** [Serum reaction an aid in the determination of agricultural seeds and feeds.] Fühl. Landw. Zeit. 67: 114–120. 1918.—An antiserum, produced by inoculating into animals (rabbits) a certain albumen, possesses the power of causing precipitation of the substance used for inoculation. By means of such a serum reaction it is possible to clearly distinguish between various agricultural seeds and feeds and easily detect adulterations. In preparing the material for inoculation the seeds are ground into a fine powder, extracted with a 10 per cent sodium chlorid solution, the extract filtered and the protein precipitated with ammonium sulphate. The precipitate is filtered, washed and dried. Before being used the dried powder is dissolved in a physiological salt solution—5 grams of the powder in 100 cc. of solution. Of course, it must also be borne in mind that the serum is in many cases specific only when used in the proper dilution.—*Ernst Artschwager.*

9. Brown, W. H., and A. F. Fischer. **Philippine forest products as sources of paper pulp.** Forest. Bur. Philippine Islands Bull. 16. *13 p. Pl. 1.* (1918) 1919.—See Bot. Absts. **5,** Entry 161.

10. Bussy, P. **Étude agricole des terres de la Cochinchine.** [An agricultural study of the soils of Cochinchina.] Bull. Agric. Inst. Sci. Saigon 2: 1–11. 1920.

11. Chalmers, D. F. **Report on the operations of the Department of Agriculture, Burma, 1919.** *15 p.* 1919.—The annual report of the Director of Agriculture for Burma, giving the results of development and testing of improved varieties of crop plants, commonly cultivated in Burma. Pebyugale, a variety of *Phaseolus lunatus*, condemned for export purposes on account of its hydrocyanide content, is found to contain a negligible amount of the poison.—*Winfield Dudgeon.*

12. Chevalier, A. **Culture et valeur alimentaire des principales légumeneuses tropicales.** [Culture and food value of the principal tropical legumes.] Bull. Agric. Inst. Sci. Saigon 1: 330–340. 1919.—A general discussion of the commonly cultivated species of the genera *Soja, Arachis, Mucuna, Phaseolus, Vigna,* etc.—*E. D. Merrill.*

13. Chittenden, E. J. **The effect of "place" on yield of crops.** Jour. Roy. Hortic. Soc. 44: 72–74. *Fig. 20, 21.* 1919.—This is a report of a comparison of yields of outside and inside rows of potatoes planted in plots in which the yields averaged 100 for the former to 72 for the latter.—*J. K. Shaw.*

14. Christianson, C. **General consideration of peat problems.** Jour. Amer. Peat Soc. 13: 7–9. 1920.—Peat and peat lands are valuable for both agricultural and industrial purposes. Working out the details of the utilization of peat lands for agricultural and fuel purposes, constitutes the peat problem.—*G. B. Rigg.*

15. Clouston, D. **The selection of rice on the Raipur Experimental Farm.** Agric. and Co-op. Gaz. [India] 15[1]: 5–9. 1919.—See Bot. Absts. 4, Entry 543.

16. Collens, A. E., and others. **Sugar-cane experiments in the Leeward Islands. Report on experiments conducted in Antigua and St. Kitts-Nevis in the season 1916–17 and 1917–18, Part 1.** Imperial Department of Agriculture, Barbados. 1919.—In Antigua the experiments were carried on at nine different stations of varying soil conditions. The varieties which have given the best results as plant canes over a long period of experimentation are B. 4596, Sealy Seedling, B. 6308, B. 1528 and B. 3922. B. 3412 tops the list in the experiments with ratoons over a period of 16 years. In the Colony of St. Kitts-Nevis, B. 6308 heads the list of plant canes for 1916–17. In 1917–18, Ba. 6032 is first, followed very closely by B. 6308 and B. H. 10(12). As ratoons, A. 2 and B. 1528 head the lists respectively.—*J. S. Dash.*

17. Connor, S. D. **Agricultural value of Indiana peat and necessary fertilizers.** Jour. Amer. Peat Soc. **13**: 13–17. 1920.—Indiana contains several hundred thousand acres of peat and muck soils, mostly neutral, but some acid. If properly drained and fertilized these soils are capable of producing large and profitable crops. Ordinary crops on neutral peat soils respond to potash fertilization; on acid ones to lime and phosphate.—*G. B. Rigg.*

18. Dunbar, B. A., and E. R. Binnewies. **Proso millet investigations—analysis of the oil— a characteristic alcohol.** Jour. Amer. Chem. Soc. **42**: 658–666. 1920.

19. Elayda, I. **A preliminary report on the acclimatization of alfalfa.** Philippine Agric. **8**: 70–76. *1 pl.* 1919.

20. Ellis, J. H. **The stage of maturity of cutting wheat when affected with black stem rust.** Agric. Gaz. Canada **6**: 971. 1919.—Experiments conducted at the Manitoba Agricultural College show that, contrary to popular notion, wheat attacked by rust should not be cut on the green side. Two fields of badly rusted Marquis wheat were divided into seven plots each. Seven stages of maturity starting with the late milk stage were examined in relation to weight and quality of grain yield. Premature cutting resulted in a brighter color of the grain but decreased yield. Cutting when the grain was firm showed the greatest weight per bushel and greatest yields. Grain cut in the "late" milk stage gave 56 pounds per bushel and that cut in the "firm" stage 59 pounds per bushel.—*O. W. Dynes.*

21. Francis, T. C. **Tobacco-growing in Cuba.** Sci. Amer. Supplem. **88**: 304–305. *6 fig.* 1919.

22. Garner, W. W., and H. A. Allard. **Effect of the relative length of day and night and other factors of the environment on growth and reproduction in plants.** Jour. Agric. Res. **18**: 553–605. *Pl. 64–79, 35 fig.* 1920.—The duration of the daily period of illumination was found to be a factor of the first importance in the growth and development of plants, particularly with respect to sexual reproduction. At Washington, D. C., during the summer months a number of species and varieties were subjected to continuous daily periods of solar illumination of 5, 7 and 12 hours' duration, by placing the different series of test plants in a dark chamber at 3, 4 and 6 o'clock, p.m., respectively, and returning them to the open at 10, 9 and 6 a.m., respectively, on the following morning. In certain cases the daily exposure consisted of two periods, daylight at 10 a.m. and 2 p.m. to dark, 4 hours of darkness at midday thus intervening. The control plants were fully exposed throughout the entire day. *Soja max, Nicotiana tabacum, Aster linariifolius, Mikania scandens, Phaseolus vulgaris, Ambrosia artemisiifolia, Raphanus sativus, Daucus carota, Lactuca sativa, Brassica oleracea, Hibiscus moscheutos, Viola fimbriatula, Solidago juncea,* were used. In all species tested the rate of growth was proportional to the duration of the daily exposure to light. The length of the vegetative period (germination to flowering stage) was shortened, lengthened or not affected, depending on the species and variety. The time required for ripening of fruit was markedly reduced. Under the artificially shortened daily illumination the duration of the vegetative period of early, medium, late, and very late maturing varieties of soy beans was only 21 to 28 days while the respective periods of the controls were 26, 62, 73, 110 days. All varieties thus behaved as early maturing ones. Similarly, the vegetative period of *Aster linariifolius* was reduced from 122 to 36 days and that of Maryland Mammoth tobacco was reduced from 155 to 60 days while Connecticut Broadleaf tobacco was not materially affected. A variety of *Phaseolus vulgaris* from the tropics attained the flowering stage in 28 days under the shortened exposures as against 109 days required by the controls, and the corresponding periods for *Ambrosia artemisiifolia* were 27 and 85 days. *Mikania scandens, Raphanus sativus* and *Hibiscus moscheutos*, on the other hand, were unable to flower under the reduced light exposures. Two daily exposures with 4 hours' darkness intervening had little effect on time of flowering. By suitably controlling the duration of the daily illumination soy beans, aster and ragweed were induced to complete two vegetative and reproductive cycles in one season. The relation of the seasonal length of day to the natural distribution of plants and to practical

crop production are discussed. The above results showing the significance of the length of day in sexual reproduction were confirmed by the use of incandescent electric lights to lengthen the normal daily illumination period during the winter months. Under suitable exposures *Fagopyrum vulgare*, *Spinacea oleracea* and other plants assumed the ever-blooming type of development. Although the plants of buckwheat showed general similarity in behavior under the normal illumination of the short winter days, the individuals growing under the influence of the lengthened illumination period manifested striking differences among themselves in time of flowering and in size attained. Under controlled conditions differences in water supply and light intensity were without effect on the time of flowering of soy beans. It is tentatively concluded that: Sexual reproduction can be attained by the plant only when it is exposed to a specifically favorable length of day (the requirements in this particular varying widely with the species and variety), and exposure to a length of day unfavorable to reproduction but favorable to growth tends to produce gigantism or indefinite continuation of vegetative development, while exposure to a length of day favorable alike to sexual reproduction and to vegetative development extends the period of sexual reproduction and tends to induce the "ever-bearing" type of fruiting. The term *photoperiodism* is suggested to designate the phenomena disclosed. A bibliography is appended.—*W. W. Garner.*

23. Hawtrey, S. H. C. **Notes on a few useful plants and home industries of Paraguay.** South African Jour. Indust. 3: 35–41. 1920.

24. Helyar, J. P. **Report of the Department of Seed Analysis.** New Jersey Agric. Exp. Sta. Ann. Rept. 1918: 93–97. 1919.—Gives a summarization of the tests for field crop seeds, vegetable seeds and corn.—*Mel. T. Cook.*

25. Hendry, G. W. **Mariout barley with a brief discussion of barley culture in California.** California Agric. Exp. Sta. Bull. 312: 57–109. *Fig. 19.* 1919.—A brief history of Mariout barley is given, including an account of its introduction into the United States. The bulletin is devoted mainly to a discussion of the practical aspects of barley culture in California. The moisture and soil requirements, methods of preparing the soil and seeding, methods of harvesting the crop and comparative yields in different states are discussed.—*W. P. Kelley.*

26. Hepner, Frank E. **Wyoming forage plants and their chemical composition.** Wyoming Agric. Exp. Sta. Ann. Rept. 28 (1917–18): 117–128. 1918.—This paper consists of two parts. Part I deals with the relation of the soil to the nitrogen content of high altitude plants. In earlier work done at this station (Wyoming Agric. Exp. Sta. Bulls. 65, 70, 76, and 87) it was discovered that the native plants were richer in nitrogen than those of the same species grown in the more humid climates of lower altitudes, and later investigations developed the fact that there was a tendency for the nitrogen content to increase with the altitude. In an attempt to find out whether the cause of this increase might not be found in the higher nitrogen content of the soil at higher altitudes, 54 samples of 33 different species of grasses, sedges and rushes were collected at different altitudes and at the same time the soils on which they grew were sampled. These were analyzed and the results are given in tabular form. These results appear to show that the increase of nitrogen in the plants at higher elevation is not so marked as the earlier work would indicate, although the statements made in the earlier bulletins were generally true. Regarding the question as to whether the soils of high altitudes are richer in nitrogen than those of lower elevations, the conclusion is that although nitrogen in the soil is practically the sole source of the nitrogen in the plant, and that the quantity present doubtless exerts a considerable influence on the amount taken up by the plant, still the abundance of nitrogen found in high altitude grasses is not due entirely, if at all, to the greater amount of nitrogen, either total or nitrate, in the soils, nor is it due to excessive quantities of any other soil constituent. Part 2 gives the complete proximate analyses of some of the forage plants including those dealt with in the previous paper. They are all Grasses, Sedges, and Rushes, including *Agropyron occidentale* Scribn.; *Agropyron pseudo-*

repens Scribn. & Smith; *Agropyron tenerum* Vasey; *Agrostis alba* L; *Beckmannia erucaeformis* (L) Host; *Bouteloua oligostachya* (Nutt.) Torr.; *Bromus inermis* Leyss; *Bromus porteri* (Coult.) Nash; *Carex aristata* R. Br.; *Carex festiva ebenea* (Rydb.) A. Nels.; *Carex nebrascensis* Dew; *Carex scopulorum* Holm; *Carex siccata* Dew; *Carex utriculata* Boott.; *Carex variabilis* Bailey; *Deschampsia caespitosa* (L.) Beauv.; *Eleocharis palustris* L.; *Elymus macounii* Vasey; *Glyceria grandis* Wats.; *Hordeum jubatum* L; *Juncus balticus* L; *Juncus longistylis* Torr.; *Juncus nodosus* L; *Juncus mertensianus* Bong; *Juncus richardsonianus* R. & S.; *Phleum alpinum* L; *Phleum pratense* L; *Poa reflexa* Vasey & Scribn.; *Poa nevadensis* Vasey; *Puccinellia airoides* (Nutt.) Wats & Coult.; *Scirpus americanus* Pers.; *Sporobolus airoides* Torr.; *Sporobolus brevifolius* (Nutt.) Scribn.; *Trisetum subspicatum* Beauv.—*James P. Poole.*

27. Hillman, F. H., and Helen M. Henry. **Identification of seed of Italian alfalfa and red clover.** Seed World 7[3]: 15. 1920.—Studies made in the Federal Seed Laboratory of the United States Department of Agriculture indicated that it is possible for the expert seed analyst to identify with reasonable certainty alfalfa and red clover seed grown in Italy, when the seed is represented by samples of sufficient size. The six kinds of incidental seeds peculiar to the Italian strains constitute the basis of identification, namely: *Hedysarum coronarium*, *Galega sp.*, probably *G. officinalis*, *Trifolium supinum*, *Cephalaria transylvanica* of the Dipsacaceae, a species of Phalaris closely allied to *Phalaris canariensis*, and an undetermined species of Valerianella very similar to *V. dentata.*—*M. T. Munn.*

28. Hiltner, Lorenz. **Vermehrte Futtergewinnung aus der heimischen Pflanzenwelt. 1. Teil. Die Gewinnung von Futter auf dem akerland. II. Teil. Wald, Heide und Moor als Futterquellen. Die Verwertung der Wasser- und Sumpfpflanzen. Futtergewinnung aus Gemüse—Obst-, Wein- und Hopfengarten.** [Increased forage production from the native flora. Pt. 1. Obtaining of cattle feed from the farm. Pt. 2. Forest, meadow and moor as sources of cattle feed. The use of aquatic and swamp plants as cattle feed, etc.] Stuttgart, 1917–1918.—The first part of Hiltner's book was written in the spring of 1917 and is perhaps best described to American agronomists by saying that it is comparable in subject-matter and manner of treatment to a high-grade station or Department bulletin on forage and fodder crops, with special reference to war conditions. The 84 pages of this publication are devoted to a discussion of forage products grown on the fields, both cultivated plants and weeds. Under each of the more important crops the author gives the composition in terms of the percentage of protein, fat, and nitrogen-free extract, discusses methods of culture, fertilizers, and the best methods of utilizing the feed, whether green, ensiled, or as dried feed. In the second part, written in the spring of 1918, the author discusses fodder that may be secured from woodland, moorland, or other waste lands, water and swamp plants, feeds from the waste of gardens, orchards, vineyards, and hop fields. And finally, in an appendix the author discusses the methods of treating straw to make it a desirable feed.—In 1913 Germany imported a total of one million tons (of 1000 kg. each) of food stuffs for farm animals. This had a value of 43.3 marks per head of large live stock (Hauptgrossvieh), while the value of food imported for human consumption was valued at 26.66 marks per capita. A large part of the imports too consisted of protein and fat-rich foods. The object of Hiltner, therefore, is to point out how German farmers may increase their output of forage by producing more per acre or by utilizing weeds and other plants not commonly used, and waste products. Much of the advice given the German farmer would be inapplicable to American conditions because of the considerable amount of hand labor involved. The saving of waste products by laborious processes may be necessary under certain conditions, but would certainly not appeal to American farmers.—The author frankly points out that while many plants not commonly used may be fed, these will in most cases serve only as roughage, and have not the protein or fat content to make them valuable as substitutes for imported concentrates.—The discussion in part I falls under five heads: 1. Legumes and clovers. 2. Potatoes. 3. Sugar beets, mangels, swedes, carrots. 4. Miscellaneous forage plants. 5. Weeds.—The cultivation of legumes is urged but nothing new is brought out. Most emphasis is placed on potatoes and sugar beets. Before the war 12 per cent of the arable land in Germany was devoted to pota-

toes and 40 per cent of the crop was fed to animals. Besides the tubers the herbage, cut just as the tubers ripen can be used as hay or ensilage. Miscellaneous information is given on various minor forage plants and weeds with a view to the more general utilization of everything edible.—In part II food stuffs to be secured from trees, shrubs, water and swamp plants and from various water products are discussed.—The use of forest tree foliage and twigs is especially urged and there is an alphabetical list of species under which are given the essential items of information for each species.—Wood, chemically treated, was being used in 1918 but apparently not as yet very largely or successfully. The author refers hopefully however to many plans underway. In an appendix the treatment of straw with caustic soda is discussed.—*A. J. Pieters.*

29. Himber, F. C. **Flour and mill feed prices.** North Dakota Agric. Exp. Sta. Special Bull. 15: 360–368. 1919.—A questionnaire sent to flour mills in North Dakota secured wholesale flour prices at a date when federal supervision of milling was in force and thereafter. Comparative profits on flour and mill feeds are discussed.—*L. R. Waldron.*

30. Holmes Smith, E. **Flax cultivation.** South African Jour. Indust. 2: 1153–1159. 1919.

31. Jabs, Asmus. **Einiges über unsere Torfmoore. [Notes on our peat bogs.]** Naturwissenschaften 7: 491–495. 1919.—The agricultural use of peat lands in Germany as well as the industrial uses of peat are discussed in the light of post-war conditions.—*Orton L. Clark.*

32. Jones, James W. **Beet top silage and other by-products of the sugar beet.** U. S. Dept. Agric. Farmers Bull. 1095. *24 p. Fig. 1–12.* 1919.

33. Kaiser, Paul. **Der Stachelginster. [Prickly broom. (*Ulex europaeus.*)]** Illustrierte Landw. Zeitg. 39: 38. 1919.

34. Kidd, Franklin. **Laboratory experiments on the sprouting of potatoes in various gas mixtures. [Nitrogen, oxygen, and carbon dioxide.]** New Phytol. 18: 248–252. 1919.—See Bot. Absts. 5, Entry 960.

35. Kling, Max. **Die Kriegsfuttermittel. [War live-stock food.]** Stuttgart, 1918.—This is essentially a handy compendium of information regarding the various feeds on the German market in 1918 or which might be produced by the farmer. In general it covers the same ground as Hiltner but without the cultural directions and with the data on the composition of the various substances more conveniently arranged. In many cases only the trade name and chemical composition of the substance is given. References to sources of chemical data are given, and as a rule there are one or two, rarely three analyses.—Besides prepared feeds there are data on all sorts of major and minor forage crops, trees and shrubs, weeds, swamp plants, vegetable and animal wastes. Preparations from chemically treated wood and straw are discussed and some directions given.—*A. J. Pieters.*

36. Kondo, M. **Ueber Nachreife und Keimung verschieden reifer Reiskörner (Oryza sativa). [After-ripening and germination of rice seeds in various stages of maturity.]** Ber. Ohara Inst. Landw. Forsch. 1: 361–387. 1918.—Grains in the "milk stage" are capable of germination, though the percentage germinating is small. However, if they are kept 15 days in dry storage, or 30 days in moist storage, they will germinate well. The "yellow-ripe" grains germinate sparingly, but if kept for 3 months they will germinate as well as fully ripe grains. The "fully-ripe" grains germinate at once, but germinate better if kept for a month after harvesting. The "dead-ripe" grains germinate immediately after harvesting and need no after ripening.—The after-ripening process is rapidly accomplished, if the rice seeds are kept in a dry condition, but is delayed under moist conditions. Seeds ripened under moist conditions germinate better, however, than those ripened under dry conditions. It is unnecessary to keep the seeds in the panicles.—The germination of freshly harvested,

unripe seeds is hastened after drying in the sun.—The riper the seeds and the further the afterripening has progressed, the more quickly they germinate and the higher the percentage of germination and the better the seedlings they produce.—Abnormal seedlings often appear "Milk-ripe" grains often produce radicles but no plumules. Fully ripe grains often produce plumules but no radicles.—*H. S. Reed.*

37. Kondo, M. **Ueber die in der Landwirtschaft Japans gebrauchten Samen.** [**Seeds used in Japanese agriculture.**] Ber. Ohara Inst. Landw. Forsch. 1: 261–324. *17 fig.* 1918.—An account of the morphological characters of certain seeds and their seedlings. Discusses such features as the external appearance of the seed, color, size, weight, anatomical structure of the seed coat, embryo, and seedling.—Seeds of the following plants are so described: *Raphanus sativus, Solanum Melongena, Cucurbita moschata* var. *Toonas Makino, Lagenaria vulgaris, Benincasa cerifera, Citrullus vulgaris, Luffa cylindrica, Momordica charantia, Cucumis melo, Cucumis sativus.*—Literature cited.—*H. S. Reed.*

38. Kulkarni, M. L. **Further experiments and improvements in the method of planting sugar cane and further study of the position of seed in the ground while planting.** Agric. Jour. India 14: 791–796. *Pl. 29–32.* 1919.—Sugar cane cuttings with one bud, planted with the bud pointing upward, sprouted 82 per cent and averaged 5.1 pounds per cane as compared with 50 per cent sprouting and 4.3 pounds per cane where cuttings with three buds were planted with the buds pointed sideways. The yield of crude sugar was about 25 per cent greater from the single bud plantings. Results from placing maize, cotton and jack beans with the seeds pointing upwards, sideways and downwards are given. In all cases seeds pointed upwards gave the poorest results. The author attributes poor stands and sickly plants to indiscriminate placing of seeds, or of buds where cuttings are used in planting.—*J. J. Skinner.*

39. Maceda, F. N. **Selection in soy beans.** Philippine Agric. 8: 92–98. 1919.

40. Menual, Paul, and C. T. Dowell. **Cyanogenesis in sudan grass: A modification of the Francis-Connell method of determining hydrocyanic acid.**—Jour. Agric. Res. 18: 447–450. 1920.—Sudan grass [*Andropogon sorghum Sudanensis*] is found to contain about one-third as much hydrocyanic acid as is found in grain sorghums. The quantity is greatest in the young plant and decreases rapidly as the plant matures. There is more acid in the plant in the morning than in the afternoon.—*D. Reddick.*

41. Miévelle, R. **Essais des culture du blé au Tran-ninh.** [**Experiments in cultivating wheat in Tran-ninh.**] Bull. Agric. Inst. Sci. Saigon 1: 364–369. 1919.

42. Molegode, W. **Transplanting of paddy.** Tropic. Agriculturist 52: 199–200. 1919.—Results of many experiments on the effect of transplanting rice are given which show an increase of 33⅓ to 220 per cent in yield. Figures are also given to show that in all recorded tests the increased yield and the seed saved by transplanting more than equalled the extra cost incurred by the operation.—*R. G. Wiggans.*

43. Mooers, C. A. **Planting rates and spacing for corn under southern conditions.** Jour. Amer. Soc. Agron. 12: 1–22. 1920.—In general the small and short seasoned varieties require thicker planting than the large long-seasoned varieties. Experimental results indicate a close relationship between the best rate of planting for grain production and a definite yield of grain per plant. To approximate the proper stand of corn a simple equation may be used as follows: $N = \frac{56Y}{F}$. In this equation N stands for the number of stalks per acre, Y for the expectancy or approximate production in bushels per acre of the field in question under average seasonal conditions and F is the standard varietal factor or the average weight of grain per plant in pounds at the best rate of planting as determined experimentally for the variety in question. In the spacing experiments it was concluded that the best results in practice will probably be attained with a width of row which permits the satisfactory use of tillage implements but allows the determined number of stalks to be as widely spaced as possible.—*F. M. Schertz.*

44. Moulton, R. H. **Kudzu, the latest forage plant.** Sci. Amer. Supplem. 88: 364–365. *5 fig.* 1919.—Descriptive of a rapid-growing perennial plant, rich in protein, starch and sugar, which it is asserted gives promise of becoming one of the leading sources of wealth in certain sections of the U. S., especially in some of the southern states.—*Chas. H. Otis.*

45. Mundy, H. G., and J. A. T. Walters. **Rotation experiments. 1913:1919.** Rhodesia Agric. Jour. 16: 513–520. 1919.

46. Nagel, ——. **Kartoffellagerungsversuche.** [Potato storage experiments.] Illustrierte Landw. Zeitg. 39: 6. 1919.—Contrary to the results of Noffe, who found that potatoes lost the least starch when stored in a cool, dry, but well lighted place, the author's experiments resulted in the least loss of both starch and sugar in potatoes stored in a cool, dry, but dark place. Tables showing the percentages of loss under different conditions are given.—*John W. Roberts.*

47. Oldershaw, A. W. **The value of lupins in the cultivation of poor, light land.** Jour. Ministry Agric. Great Britain 26: 982–991. *Fig. 1–3.* 1920.—The value of the cultivation of lupins (Blue and yellow, *Lupinus luteus*) as a means of improving and reclaiming poor light land is not sufficiently appreciated. Lupins grow with surprising luxuriance upon poor, blowing sand, which will grow practically nothing else but rye. The effect of a crop of lupins upon the succeeding crop is really astonishing. Information is given on the sowing, harvesting and utilization of lupins and on the removal of the possible poisonous properties from lupins.—*M. B. McKay.*

48. Parnell, F. R. **Experimental error in variety tests with rice.** Agric. Jour. India 14: 747–757. 1919.—Experimental errors in field work under Indian conditions are given and data presented. The probable error of long, narrow field plots (20 × 250 lks.) is much less than square plots.—*J. J. Skinner.*

49. Perez, P. F., Manuel A. Suárez, Manuel F. Grau, and Antonio García Villa. **Experiencias en el cultivo del tabaco.** [Experiments in the cultivation of tobacco.] Revist. Agric. Com. y Trab. 2: 484–488. 1919.—This is the report of a commission appointed by the Secretary of Agriculture to report on the results of experiments with tobacco obtained by Francisco B. Cruz. The experiments involve the comparison of tobacco grown without shade, shaded by palm leaves and shaded with cheese cloth. Tobacco produced under shade was declared most desirable for the American market. The yield produced under cheese cloth was largest.—*F. M. Blodgett.*

50. Pescott, E. E. **Excursion to Nobelius's nursery, Emerald.** Victorian Nat. 36: 9, 124, 125. Jan. 8, 1920.—Paper read before the Field Naturalists Club of Victoria, Australia. The paper is a popular account of an excursion taken to the tree-nursery of Messrs. C. A. Nobelius and Sons at Emerald. Uncultivated plants which attracted especial attention were noted including *Erica arborea*; *Ranunculus repens* the English buttercup, which has become naturalized; and *Chiloglottis* the Green Bird Orchid, a clump of which was found in the top of a tree fern. The feature of the nursery, however, was the establishment of the flax industry, many acres of land being devoted to the culture of the New Zealand Flax, *Phormium tenax.* A flax mill has been installed. The flax plants are ready to cut at three years old, and subsequently every three years for an indefinite period. The leaves are graded by throwing a bundle of them upright in a sunken cask. The different lengths are withdrawn and assembled in three grades. They are then scutched, the freed fiber washed, dried and bleached and the fiber is ready for baling and despatch to the rope mills. A ton of fiber is obtained from seven tons of leaves, whereas in New Zealand eight to ten tons of leaves are required to produce one ton of fiber. In New Zealand the flax grows best in swamps, while all of Mr. Nobelius' was hill grown. The local fiber is of superior quality—and graded "special" at the rope mills.—*F. Detmers.*

51. Plymen, F. J. **Nitrate of soda as a manure for cotton.** Agric. and Co-op. Gaz. [India] 15: 10–11. 1919.—Nitrate of soda is strongly recommended as a fertilizer for cotton. Methods for application and instructions for storage are given.—*Winfield Dudgeon.*

52. Ponsdomenech, J. **Elementos químicos necesarios a un terreno para caña.** [Fertilizer necessary for sugar cane.] Revist. Agric. Com. y Trab. 2: 489–493. 1919.

53. Powers, W. L. **The improvement of wild meadow and tule land.** Jour. Amer. Peat Soc. 13: 18–25. 1920. Oregon has about 500,000 acres of such land. There are two soil types—peat and silt loam. Its crop production can be greatly increased by regulating the water supply by drainage and irrigation.—*G. B. Rigg.*

54. Richey, Frederick D. **Formaldehyde treatment of seed corn.** Jour. Amer. Soc. Agron. 12: 39–43. 1920.—Seed corn was treated with solutions of 5, 15 and 25 cc. of formaldehyde per liter. The weakest solution did not materially affect the vitality of the seed while the 15-cc. solution was injurious, as evidenced by the germination and development in sand. The treatment with 5 cc. per liter was markedly injurious. Fungus development was best checked by soaking the seed in a solution (5 cc. HCHO in 9.95 cc. of water) and "fuming" the seed for 2–24 hours. This treatment did not interfere with the normal development of corn seedlings in water culture.—*F. M. Schertz.*

55. Rindl, M. **Vegetable fats and oils. I.** South African Jour. Indust. 3: 14–23. 1920.

56. Robson, W. **Cotton experiments.** Report on the Agricultural Department, Montserrat, 1917–18: 3–12. Imperial Department of Agriculture, Barbados, 1919.—Full account is given of the breeding and selection work with this crop done by the Agricultural Department.—*J. S. Dash.*

57. Roemer, Th. **Die technik der Sortenprüfung.** [The technique of variety testing.] Illustrierte Landw. Zeitg. 39: 35–36. 1919.—As a result of experiments to determine the best experimental technique in variety tests, the author considers the following as important factors: (1) weather (2) kind of fruit (3) size of plats (4) shape of plats (5) number of replicate plats (6) number of plats for comparison (7) situation of the plats with regard to one another 8) treatment at harvest time. The field for the experiments should be carefully selected. There should be at least six replicates of each plat. Care should be taken to give each plat proper cultivation. The author also discusses the things to be considered in determining the quality of the yield. Among these are size of grain, susceptibility to fungous attack, and ability of the seeds to germinate.—*John W. Roberts.*

58. Rosenfeld, A. H. **Kavangire: Porto Rico's Mosaic Disease-Resisting Cane.** Internat. Sugar Jour. 22: 26–33. 1920.—An account of the history and behaviour of Kavangire in the Argentine is presented.—From investigations carried on for the purpose of combating the mosaic or mottling disease of sugar cane in Porto Rico, it was found that of 20 imported varieties there was one Japanese variety (Kavangire) which proved to be immune. This cane was obtained from the National Agricultural School in Tucuman, which in turn obtained the variety from the Experiment Station in Campinas, Brazil. When tried out at the Tucuman Sugar Experiment Station, it showed on first germination remarkable vigor, dark color, high agricultural production, fair juice if left for late cropping, and extreme resistance to fungous disease and attacks of boring insects.—It is a typically thin Japanese bamboo type of cane, identical with the Uba variety of Natal and bears no relation to the Cavangerie which is a large soft red cane with faint black stripes. Experiments were continued with the variety under the name of Kavangire and a consignment of this variety was sent to the Federal Experiment Station at Mayaguez, Porto Rico.—Being resistant to root disease, borer and stem rot, and to frost, it requires less replanting than other varieties which reduces cost of production. Experiments at Tucuman with Kavangire in comparison with native striped and purple canes (Cheribon) show that the yield of cane per hectare as second, third, and fourth

year stubble of Kavangire is in each case much greater than that of the local cane. One crop of plant and four of stubble gives an average yield of cane and sugar per hectare for Kavangire of three times that of the local striped cane.—The objections to this type of cane can be controlled and if the Kavangire turns out to be the only variety in Porto Rico immune to the mottling disease, it will be adopted as the staple cane of the Island.—*E. Koch.*

59. Russell, E. J. **Report on the proposed electrolytic treatment of seeds (Wolfryn Process) before sowing.** Jour. Ministry Agric. Great Britain 26: 971–981. 1920.—Tests made chiefly with wheat, oats, and barley to determine the value of the electrolytic treatment of seeds before sowing gave uncertain results, with occasionally an increase, sometimes no influence, and at other times a reduction in yield. At present the treatment should be looked upon as an adventure which may or may not prove profitable.—*M. B. McKay.*

60. Schander, R. **Beobachtungen und Versuche über Kartoffeln und Kartoffelkrankheiten im Sommer 1917.** [Observations and investigations of potatoes and potato diseases in 1917.] Fühl. Landw. Zeit. 67: 204–226. *1 fig.* 1918.—In general, uncut tubers are to be preferred to cut tubers for seed. The practice of permitting the cut surfaces of seed potatoes to dry before planting seems to be inferior to direct planting; at least the yields are higher in the latter case. Spacing the plants 30 to 40 cm. apart in the row with the rows 50 to 60 cm. wide gives the highest net yields. In light soils the distance may be decreased while in heavy soils it may safely be increased. Varieties with red skin, notably variety Wohltman, produced a number of tubers which were of a light color and contained red stripes. No explanation for this phenomenon has been given. The extreme dryness of the summer of 1917 delayed, and, in the early varieties, prevented the occurrence of late blight. On examination of the tubers, however, it was found that many were covered with mycelium of *Phytophthora infestans*. After all, is the fungus carried on the tubers and does it from them enter the stems and foliage? The stems and foliage seem to be least resistant to the fungus between the time of flowering and maturity. The best way to combat the fungus is to grow varieties which, at the time of the appearance of the fungus, are but little affected.—*Ernst Artschwager.*

61. Shepherd, F. R. **Cotton experiments.** Report on the Agricultural Department, St. Kitts-Nevis, 1917–18: 7–14. Imperial Department of Agriculture, Barbados. 1919.—Details given relating to selection work with cotton in the Colony; bolling and flowering curves are included.—*J. S. Dash.*

62. Stokes, Fred. **The food value of vegetables.** Jour. Roy. Hortic. Soc. 44: 21–30. 1919.—See Bot. Absts. 5, Entry 1857.

63. Störmer, ——. **Keimungshemmungen bei blauen Lupinen.** [A case of arrested germination in blue lupines.] Illustrierte Landw. Zeitg. 39: 12. 1919.—The seeds of the 1918 crop of blue lupines gave a germination percentage of only 24. However, a high percentage of germination (89 to 92 per cent) was obtained after treatment with concentrated sulphuric acid for 15 minutes, followed by a thorough washing with water and then drying.—*John W. Roberts.*

64. Störmer, ——. **Die Anwending von schwefelsäuren Ammoniak und Kalkstickstoff als Kopfdügung zu Winterroggen.** [The use of ammonium sulphate and calcium nitrate as the principal fertilizers for winter rye.] Illustrierte Landw. Zeitg. 39: 73–74, 83–84. 1919.

65. Taylor, H. W. **Tobacco culture. Harvesting and curing.** Rhodesia Agric. Jour. 16: 521–530. *6 fig.* 1919.

66. Trueman, J. M. **Fourteenth Annual Report of the Nova Scotia Agricultural College and Farm. Part 2—Report of J. M. Trueman, Professor of Agriculture and Farm Superintendent.** Prov. of Nova Scotia Ann. Rept. Secretary Agric. 1918: 26–50. 1919.

67. Vendrell, Ernesto. **Estudio sobre los abonos verdes en rotacion con las demás plantas cultivadas en Cuba.** [Green manures in the rotation.] Revist. Agric. Com. y Trab. 2: 553–556. 1919.

68. Vieillard, P. **Notes sur le fonctionnement de quelques services de recherches agricoles de Java.** [Notes on the functions of certain services of agricultural research in Java.] Bull. Agric. Inst. Sci. Saigon 1: 353–358. 1919.

69. Waldron, L. R., and John C. Thysell. **Report of the Dickinson Sub-station for the years 1914 to 1918 inclusive.** North Dakota Agric. Exp. Sta. Bull. 131. *84 p. 19 fig.* 1919.—Authors not jointly responsible. Yields are given for wheat, oats, barley, emmer, flax, maize, potatoes, and certain forage crops for the years indicated and for earlier years for certain crops. Also tables are presented showing the effect of the previous crop treatment and cultural treatment upon the succeeding crop, especially upon the wheat crop. Weather data are presented.—*L. R. Waldron.*

70. Westover, H. I., and Samuel Garver. **A cheap and convenient experimental silo.** Jour. Amer. Soc. Agron. 12: 69–72. 1920.—Experiments conducted at Redfield, S. Dakkota, showed that nearly all of the common plants can be preserved as silage which is readily eaten by cattle. Motor oil barrels were used as experimental silos.—*F. M. Schertz.*

71. Wilson, J., and F. J. Chittenden. **Some further experiments with potatoes.** Jour. Roy. Hortic. Soc. 44: 83–88. 1919.—*I. Effect of spacing on yield.* In 1917 nine different spacings were used. In 1918 more spacings, namely sixteen, were used ranging from 9 to 18 inches between plants in the row. For spacings used in 1918 they reiterate their conclusions drawn in 1917 as follows: "(1) The greater the space given to the individual plant the greater the yield of that individual is likely to be. (2) The greater the number of plants on a given area the greater the yield from that area will be." In spacing the other important factors besides yield that must be given due consideration are "relative quantity of seed required," "convenience in cultivating among and earthing up the plants and the need of circulation of air as a preventative of disease."—*II. Effect of different origin on yield of potatoes.* The author is of the opinion that locality alone is not a guarantee of seed potatoes of high producing value. Other factors besides immaturity of seed potatoes at time of planting may be important. Emphasis is laid upon the importance of uniform condition of temperature and moisture in the soil during the growing and maturation periods.—*H. A. Jones.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

Lincoln W. Riddle, *Editor*

72. Anonymous. **Ethel Sargant. (1863–1918.)** New Phytol. 18: 120–128. *2 fig.* 1919. —This is an obituary account of Miss Sargant, with a critical appreciation of her botanical work. A bibliography of her papers is appended.—*I. F. Lewis.*

73. Anonymous. **Introduction of the sugar-cane into the West Indies.** Agric. News [Barbados] 18: 242. 1919.—Information given is based principally on what is known of the life and voyages of Christopher Columbus, and it appears that sugar-cane was not indigenous to the West Indies but that it was introduced by Columbus on his second voyage about 1493. —*J. S. Dash.*

74. Barber, C. A. **Reminiscences of sugar cane work in India.** International Sugar Jour. 21: 390–395. 1919.—An historical account of the difficulty of cane growing in India due to faulty methods of cultivation and an attack of *Colletotrichum falcatum* is presented. Barber worked out a system for cultivation and discovered resistant varieties which when introduced to the cultivators made cane growing successful.—*E. Koch.*

75. Bonnier, G. **Notice sur Viviand-Morel.** Rev. Gén. Bot. **31**: 5–9. 1919.—A brief sketch of M. Viviand-Morel (1843–1915), a French taxonomist whose researches dealt chiefly with the problem of elementary species.—*L. W. Sharp.*

76. Chodat, R. **Casimir De Candolle, 1836–1918.** [Avec un portrait.] Arch. Sci. Phys. Nat. Genéve v: **1**: 5–28. 1919.—Anne Casimir De Candolle was born in Geneva. Feb. 20, 1836, the son of Alph. De Candolle. He received a thorough training in physics, mathematics and chemistry in Paris under the direction of Berthelot. He then visited London where he remained for some time with the mycologist Berkeley. England became to him a second home; there he married the daughter of a fellow countryman and there his four children were born. De Candolle's botanical contributions were varied, including collaboration with his distinguished father on the Prodromus; but his love for the physical sciences led him mainly into the newer physiological fields of his day, and it was in these fields that he did his best work. De Candolle's strong human sympathies and great versatility won many close friends, and his death is widely lamented. One son, M. Augustin, continues the botanical labors of the family De Candolle, a race of outstanding botanists.—*J. H. Faull.*

77. Farlow, W. G., Roland Thaxter, and L. H. Bailey. **George Francis Atkinson.** Amer. Jour. Bot. **6**: 301–302. 1919.—A sketch of the life and work of Professor Atkinson.—*E. W. Sinnott.*

78. Fitzpatrick, Harry M. **George Francis Atkinson.** Science **49**: 371–372. 1919.—An appreciation of Professor Atkinson as a teacher, investigator and friend, together with a brief résumé of his life and work.—*A. H. Chivers.*

79. Fitzpatrick, Harry M. **Publications of George Francis Atkinson.** Amer. Jour. Bot. **6**: 303–308. 1919.—A compilation of 178 titles of Professor Atkinson's papers, arranged in chronological order.—*E. W. Sinnott.*

80. Friedel, J. **Notice sur Charles-Louis Gatin.** Rev. Gén. Bot. **31**: 65–74. *Portrait.* 1919.—An account of the work of Charles-Louis Gatin (1877–1916), a French botanist who fell at Douaumont. In Algiers and at the Sorbonne he carried out a number of important researches on the anatomy and physiology of germination in palms and certain other monocotyledonous families. A list of his 51 papers is given.—*L. W. Sharp.*

81. Hamilton, A. G. **List of papers and books on, or containing references to, the pollination of Australian plants.** Australian Nat. **4**: 81–86. 1919.

82. Janvrin, C. E. **The scientific writings of Thomas J. Burrill.** Trans. Illinois Hortic. Soc. **51**: 195–201. 1918.—A complete bibliography of the scientific publications of this pioneer botanist is given. The first paper was in 1869 and the last in 1917. Most of the papers dealt with some phase of plant pathology.—*H. W. Anderson.*

83. Krok, Th. O. B. **En sällsynt botanisk skrift.** [A rare botanical publication.] Bot. Notiser 1919: 165–166. 1919.—In the Royal Library at Stockholm, there is found a little publication of 31 unnumbered pages in small 8vo, entitled: "Catalogus plantarum Tám in excultis quam incultis locis prope Aboam superiori aestate masci abservatarum. In gratiam Philo-Botanicorum concinnatus. Ab Elia Til-Landz. Maij 1673, Aboae-Excusus â Petro Hansonio." This is the only copy now known in existence. It contains the enumeration of 496 plants, wild and cultivated. A second edition was published in Åbo 1683, enumerating 536 plants. Til-Landz was born in 1640. His original name was Tillander, but after having been saved from a shipwreck, he changed it to Til-Landz, which means "on land." Linnaeus named Tillandsia of the Family Bromeliaceae after him.—*P. A. Rydberg.*

84. Mangin, L. **Paul Hariot (1854–1917). Notice nécrologique.** [Obituary notice.] Bull. Soc. Path. Veg. France **5**: 65–70. [With portrait.] 1918. [Issued April 1919.]—The subject of this notice was the son of a pharmacist and was trained in the same profession. His

first botanical work was in connection with an expedition to Cape Horn. Upon his return to Paris, he became associated with Van Tieghem in the Natural History Museum. He was chiefly interested in the algae and fungi. Later he gave special attention to the rusts, and became one of the founders of the Plant Pathological Society of France. At the time of his death, he was curator of the Cryptogamic Herbarium at the Jardin des Plantes. [See also next following Entry, 85.]—*C. L. Shear.*

85. Mangin, L. **Paul Hariot (1854–1917). Notice nécrologique.** [Obituary notice.] Bull. Trimest. Soc. Mycol. France 35: 4–11. 1919.—See also next preceding Entry, 84.

86. Mitra, Sarat Chandra. **On the use of the swallow-worts in the ritual, sorcery, and leechcraft of the Hindus and the Pre-Islamitic Arabs.** Jour. Bihar and Orissa Research Society [Patna] 4: 191–213, 351–356. 1918.—Treats of religious beliefs and ritualistic practices with reference to *Calotropis gigantea* and *C. procera.*—*B. Laufer.*

87. [Nordstedt, C. T. O.] [Swedish rev. of: Gertz, O. **Christopher Rostii Herbarium Vivum i Lund.**] Bot. Notiser 1918: 214. 1918.—A notice of a Pre-Linnean herbarium found in the University Library at Lund, Sweden. It has the title: "*Herbarium vivum de anno* 1610," and contains 372 plants. It became the property of the University in 1687.—*P. A. Rydberg.*

88. Ostenfeld, C. H. **Botanikeren Johan Lange.** [**John Lange, the botanist.**] Bot. Tidsskr. 36: 175–181. 1918.—Address on the occasion of the commemoration of the birth of John Lange, author of the handbook of the Danish flora. This took place on March 20, 1918. —*A. L. Bakke.*

89. Pammel, L. H. **Recent literature on fungous diseases of plants.** Rept. Iowa State Hortic. Soc. 53: 185–225. 1918.—Contains abstracts of recent literature on fungous diseases of plants under the following heads, diseases of apple, pear or quince; diseases of the potato; tomato diseases; root crops and vegetable diseases; diseases of forest trees; miscellaneous diseases of fruits; miscellaneous fungicides; diseases of cereal and forage crops; systematic papers, biographical and historical. Under the last topics are given a review of Whetzel's History of Phytopathology, and notices of R. H. Pearson, H. S. Coe, Geo. F. Atkinson, V. M. Spalding, Byron D. Halsted and P. H. Mell.—*L. H. Pammel.*

90. Roberts, H. F. **The founders of the art of breeding. I.** Jour. Heredity 10: 99–106. *4 fig.* 1919.—An historical discussion of the investigations and writings of the founders of the art of breeding. It is shown that sex was recognized in the date palm by the Babylonians and Assyrians but was forgotten. The Greek writers, Aristotle, Pliny and Theophrastus, commented upon the supposed nature of sex in plants, but it remained for Camerer, professor of Natural Philosophy in the University of Tübingen in 1694, to discover by actual experiment that pollination is indispensable to seed production. The article closes with a bibliography of the early publications. [See also next following Entry, 91.]—*M. J. Dorsey.*

91. Roberts, H. F. **The founders of the art of breeding. II.** Jour. Heredity 10: 147–152. *1 fig.* 1919.—The second article describing the work of the early hybridists. Koelreuter published a series of articles from 1761 to 1766 in which he records the results of 136 experiments in crossing plants. To Koelreuter belongs the credit of having produced in 1760 the first plant hybrid—a cross between *Nicotiana paniculata* and *N. rustica.* He also experimented with other plants. The author points out, however, that Thomas Fairchild, an Englishman, crossed two kinds of pinks 41 years previous to the experiments of Koelreuter, and that Richard Bradley, who wrote of the experiments of Fairchild, had, two years before this (1717), removed the anthers from twelve tulips in a remote corner of the garden and found that they produced no seeds, while some four hundred others in another section of the garden produced seeds freely. Still others experimented with sex in plants before the work of Koelreuter. In 1739 James Logan, governor of Pennsylvania, found that when isolated corn plants

were detasseled, or the ears covered before pollination, no seeds developed. He showed the direct relation of the tassels to seed production by cutting the tassels off of a portion of the ear before pollination, in which case he found that that portion from which the tassels were cut bore no grains. Philip Miller repeated the experiments of Bradley in 1741. In 1750 Gleditsch published a learned account of his experiments in the palm. A pistillate palm some eighty years old had never fruited but when pollinated with "male" pollen bore fruit, the seeds of which germinated in 1751. Thus between the time of Camerarius and Koelreuter a number of experimenters were investigating sex in plants, but these experiments appeared to have had but little influence upon the scientific thought of their day. Following these experiments Sprengel (1750–1816) first showed the extent of insect pollination. In the early 19th century the work of Andrew Knight and William Herbert in England and Gärtner in Germany is outstanding. The author shows that there were many breaks in the trend of thought regarding sex in plants up to the time of the publication of Mendel's papers in 1866. [See also next preceding Entry, 90.]—*M. J. Dorsey.*

92. Romell, L. **Svamplitteratur, särskilt för studium av hymenomyceter (hattsvampar).** [Mycological literature, especially for the study of the hymenomycetes (cap fungi).] Svensk. Bot. Tidskr. [Stockholm] **13**: 110–112. 1919.—See Bot. Absts. 5, Entry 680.

93. Rosenvinge, L. Kolderup. **Jacob Severin Deichmann Branth.** Bot. Tidsskr. **36**: 213–218. 1918.—A biographical sketch of Branth, the well known student of the lichens of Denmark.—*A. L. Bakke.*

94. Shear, C. L., and Neil E. Stevens. **The mycological work of Moses Ashley Curtis.** Mycologia **11**: 181–201. 1919.—The life and work of Curtis as revealed mainly through his correspondence is presented in a thorough manner. He was not only a mycologist but also a student of flowering plants and lichens. He collected lichens at the suggestion of Tuckerman (1845), and then turned his attention to the fungi (1846). In 1848 appeared his first mycological paper, in which he acknowledges indebtedness to Berkeley for assistance in its preparation. From 1846 to 1872 he corresponded with Berkeley, exchanging notes and specimens of fungi and thus making possible the important mycological contributions which appeared under their joint authorship. Curtis's original herbarium now forms part of the Farlow Herbarium of Harvard University. Among other institutions which are known to have collections of Curtis's fungi are the Royal Botanical Garden, Kew, England; the U. S. Department of Agriculture, the New York State Museum, and the University of Nebraska. —*H. R. Rosen.*

95. Stevens, N. E. **Two southern botanists and the Civil War.** Sci. Monthly **9**: 157–166. 1919.—Rev. M. A. Curtis and H. W. Ravenel were distinguished for their contributions to botany, especially in the field of mycology. The letters of these two botanists to each other and to others are quoted and commented upon. In those days as well as in the world war just ending, the botanist placed his knowledge at the disposal of his country.—*L. Pace.*

96. Whetzel, H. H. **George Francis Atkinson.** Bot. Gaz. **67**: 366–368. *Fig.* 1919.—A biographical sketch.

BOTANICAL EDUCATION

C. Stuart Gager, *Editor*

Alfred Gundersen, *Assistant Editor*

97. A[damson], R. S. **The quadrat method.** [Rev. of: Weaver, J. E. **The quadrat method in teaching ecology.** Plant World **21**: 267–283. *7 fig.* 1918.] Jour. Ecol. **7**: 216. 1919.

98. Anonymous. [Rev. of: Bower, F. O. **Botany of the living plant.** Macmillan and Co.: New York, 1919.] New Phytol. **18**: 259–261. 1919.

99. Anonymous. [Rev. of: Cork, M. T. **Applied economic botany.** *261 p., 142 fig.* J. B. Lippincott: Philadelphia, 1919.] Amer. Bot. 25: 116–117. Aug., 1919.—"One of the first books to indicate an approaching change in the subject matter of plant studies."—*Reviewer.*

100. Anonymous. [Rev. of: Ellis, G. S. M. **Applied botany.** *viii + 248 p. 67 fig. 2 maps.* Hodder & Stoughton. "One of the new teaching series of practical text-books."] Jour. Botany 58: 93–94. 1920.

101. Bancroft, Wilder T. [Rev. of: Buisson, Ferdinand, and Frederick E. Farrington. **French educational ideals of today.** 21 × 14 cm., *xii + 326 p.* Yonkers-on-Hudson: World Book Company, 1919. $2.25.] Jour. Phys. Chem. 24: 80. 1920.—"It is a good book and an interesting one" but the title is misleading for "it does not help the university teacher with his problems and never was intended to."—*H. E. Pulling.*

102. Boulger, G. S. [Rev. of: Martin, John N. **Botany for agricultural students.** *x + 585 p.*] Jour. Botany 58: 29–30. 1920.

103. Buckman, H. C. **The teaching of elementary soils.** Jour. Amer. Soc. Agron. 12: 55–57. 1920.—The paper discusses the placing of soil science on a sound theoretical pedagogical basis.—*F. M. Schertz.*

104. Clute, Willard N. **Plant names and their meanings.** Amer. Bot. 25: 122–129. 1919.—The derivation of scientific and vernacular names of the Ranunculaceae discussed.—*W. N. Clute.*

105. Davis, Bradley M. **Introductory courses in botany.** School Sci. Math. 20: 52–56. Jan., 1920.—Outline No. 7. Structure and function, breeding, economic plants, plant communities. Activities and structure showing adaptation emphasized. Outline No. 8. Parts of seed plants, the cell, functions, life histories, plant families, evolution. Emphasis on philosophical aspects. Outline No. 9. History of botany, soil, root, transpiration, photosynthesis, respiration, growth, reproduction. Classification. Emphasis on functions. Outline No. 10. Structure and function of tissues 3 weeks, reproduction 3 weeks, survey of plants: thallophytes 4 weeks, higher plants 3 weeks. [See also next following Entry, 106.]—*A. Gundersen.*

106. Davis, Bradley M. **Introductory courses in botany IV.** School Sci. Math. 20: 352–360. April, 1920.—Outline No. 11. Water relations of plants, nutrition, growth, seeds. Dependent plants. Principal groups of independent plants, industries, plant geography.—No. 12. Seed plant, composite flowers, herbarium of autumn flowers, weeds, pollination, seeds, trees, fall gardens. Algae, bacteria, etc.—No. 13. Plant as a whole. Seeds, fruits, bacteria, yeast, algae and main groups. Last forestry, gardening, orcharding.—No. 14. Nasturtium or Bouncing Bet and composite. Weeds, fruits, bulbs, bacteria, algae, etc., ending with leaves and flowers.—No. 15. Morphology of common plants, physiology, commercial products. Trees, soils, wild flowers, weeds. Decorative planting, plant breeding, seeds, ecology, the cell, algae, fungi, field trips.—No. 16. Algae, bacteria, fungi, gymnosperms, plant physiology, water relations, soils, monocotyledons and dicotyledons, roots, fertilization, budding, fertilizers, weeds, visits to farms. [See also next preceding Entry, 105.]—*A. Gundersen.*

107. Giles, J. K. **Corn club lessons.** Georgia State Coll. Agric. Bull. 193. *20 p., 3 fig.* 1920.—Contains ten lessons for the Corn Club boys, as follows: No. 1, History of corn (*Zea Mays*); No. 2, Fall preparation; No. 3, Preparation of the seed bed; No. 4, Seed corn; No. 5, Planting; No. 6, Cultivation; No. 7, Selection of seed corn; No. 8, Grow legumes in your corn; No. 9, Selecting exhibits—score card; No. 10, Diseases and insect pests.—*T. H. McHatton.*

108. Prain, David, and others. **Report of the Committee on the Royal Botanic Society.** Royal Bot. Soc. London Quarterly Summary and Meteorological Readings 2: 4–8. Oct., 1919. —The committee was appointed by Lord Ernle to inquire and report what steps should be taken to render the work of the Royal Botanical Society of London as useful as possible from the scientific and educational point of view. The committee recommends the establishment of 1. A school of economic botany; 2. A research institute with special reference to plant physiology; 3. A center for teaching horticulture; 4. Courses in school gardening especially for teachers. The report continues with suggestions for buildings and equipment to cost about £5,500 and the organization of a staff involving an annual budget of £3,000–£3,500 (= pre-war, say £2,000–£2,250). It is also suggested that the new institute should cooperate with local colleges and botany schools by supplying material for teaching and research. [See also abst. from London Times, in Science 51: 58. 1920.]—*C. S. Gager.*

109. Randall, J. L. **Gardening as a part of city education.** Nat. Study Rev. 16: 95–97. 1920.—There is an imperative demand for a new education. The school directed home garden is the most economic form of gardening for small cities and the suburbs of larger cities. In congested parts of large cities school or vacant lot gardens must be substituted. Teachers may receive information from United States School Garden Army, Bureau of Education, Washington, D. C.—*A. Gundersen.*

110. Shaw, Ellen Eddy. **Efficiency aids to garden work.** Nat. Study Rev. 16: 89–94. 1920.—Suggestions to garden teachers in children's work on ways of preparing children for their outdoor work, and on methods of planning and planting a garden, where children have individual plots. The use of the older boys and girls as junior assistant teachers is recommended. Hints for registration of children and keeping of garden crop records.—*A. Gundersen.*

111. Smith, Arthur. **A lesson on soil formation and its bacteria.** Gard. Chron. Amer. 24: 409–410. 1920.

112. Smith, R. S. **Introductory courses in soils.** Jour. Amer. Soc. Agron. 12: 58–60. 1920.—The paper states in broad terms a tentative outline of the general purpose to be attained by an introductory soils course.—*F. M. Schertz.*

113. Stevens, F. L. **Practical botany.** [Rev. of: (1) Cook, M. T. **Applied economic botany.** *261 p., 142 fig.* J. B. Lippincott: Philadelphia, 1919 (see Bot. Absts. 3, Entry 491); (2) Martin, J. N. **Botany for agricultural students.** *585 p., 488 fig.* John Wiley and Sons: New York, 1919 (see Bot. Absts. 3, Entry 2165).] Bot. Gaz. 68: 307–308. 1919.—Cook's work is "written in attractive style, and the material is well-selected, and is a commendable effort to differentiate secondary-school botany from university botany. The numerous half-tones are of unusually good quality." In Martin's work "the presentation is botanical rather than agricultural. The line drawings are not as well done or as accurate as they should be, and the illustrations in general are in contrast with the excellent presswork and the easy and pleasing style of presentation."—*H. C. Cowles.*

114. Trelease, Sam F. **Laboratory exercises in agricultural botany.** College Cooperative Co., Inc.: College of Agriculture, Los Baños, P. I. April, 1919.—Contains 109 pages covering directions for laboratory study for agricultural students as follows: Part I. Physiological Plant Anatomy, including general characteristics of the plant, seed, plant cell, root, stem, leaf, flower, fruit; Part II. Systematic Botany, including I. Primitive organisms (*Bacteria, Cyanophyceae, Flagellata, Myxomycetes, Diatomeae*), II. Plants (*Algae, Fungi, Bryophyta, Spermatophyta*). The guide has been prepared for use with Copeland's "The first year of Botany," a multigraphed text in use at the College of Agriculture, Los Baños.—*C. S. Gager.*

115. Waller, A. E. **Xenia.** School Sci. Math. 19: 150–157. Feb., 1919.—Historical and popular account of xenia, from both a genetic and cytological standpoint. Several illustrations of xenia given, and simple demonstration experiments with maize characters, of instructional value, suggested. [See also Bot. Absts. 5, Entry 496.]—*Orland E. White.*

CYTOLOGY

Gilbert M. Smith, *Editor*
George S. Bryan, *Assistant Editor*

116. Bobilioff, W. **De inwendige bouw der schorselementen ven Hevea brasiliensis.** [The structure of cell elements in the bark of Hevea brasiliensis.] Arch. Rubbercult. Nederlandsch-Indië 3: 222–231. 1919.—See Bot. Absts. 5, Entry 546.

117. Carter, Nellie. **The cytology of the Cladophoraceae.** Ann. Botany 33: 467–478. *1 pl., 2 fig.* 1919.—The chloroplast in *Cladophora*, *Chaetomorpha* and *Rhizoclonium* consists of a parietal film lining the cell wall and often more or less reticulated. Pyrenoids are very numerous and scattered in both the peripheral and internal parts of the chloroplast. The nuclei are confined almost invariably to the chloroplast, not being found as a general rule in the colorless cytoplasm. During mitosis the nucleus of *Rhizoclonium* and *Cladophora* is characterized by the formation of a long thin spireme, which gives rise to very numerous chromosomes. After the migration of the chromosomes to the opposite poles of the spindle the daughter nuclei are separated by constriction of the spindle in the region of the equator.—*G. S. Bryan.*

118. Carter, Nellie. **On the cytology of two species of Characiopsis.** New Phytol. 18: 177–186. *3 fig.* 1919.—*Characiopsis saccata* n. sp. and *Ch. Naegelii* (A. Br.) Lemm. are treated. The cytological features of the vegetative cells were found to differ in important respects in the two species. Zoogonidangia were not found. The cytology of *Characium angustum* is also described, in which the regular successive cleavage of the protoplast contrasts strongly with the progressive cleavage found in *Ch. Sieboldii* by Smith.—*I. F. Lewis.*

119. Chambers, Robert. **Changes in protoplasmic consistency and their relation to cell division.** Jour. Gen. Physiol. 2: 49-68. 1919.—The author has continued his microdissection studies with dividing eggs of *Arbacia* and *Asterias*. Periodic changes in the consistency of the egg cytoplasm after fertilization and during cleavage are described. It is shown that the development of the amphiaster is associated with the formation of two semisolid masses within the more fluid egg substance. After the cleavage furrow has completed the separation of the two blastomeres, the semisolid masses revert to a more fluid state. By various treatments the formation of a cleavage furrow may be prevented following which the egg reverts to a single, spherical, semifluid mass with two nuclei. An egg mutilated in its semisolid state may revert to a more fluid state in which case the furrow becomes obliterated, the nuclei tend to more to positions which may assure symmetry in aster formation and a new cleavage furrow is developed, or the cleavage furrow may persist until cleavage is completed, cutting off non-nucleated segments.—*O. F. Curtis.*

120. Coulter, M. C. **A new conception of sex.** [Rev. of: Jones, W. N. **On the nature of fertilization and sex.** New Phytol. 17: 167–188. 1918. (See Bot. Absts. 3, Entry 637.)] Bot. Gaz. 68: 68–69. 1919.

121. Gatenby, J. Bronte. **Identification of intracellular structures.** Jour. Roy. Microsc. Soc. London 2: 93–119. *14 fig.* 1919.—The author tries to show certain results in practical histo-chemistry from the cytologist's point of view. Every animal cell is composed of the following fairly sharply marked bodies; nucleus, cytoplasm and centrosome. The cytoplasm is composed of (1) protoplasmic or living inclusions such as mitrochondria, Golgi apparatus and possibly other less numerous enigmatic protoplasmic granules; (2) deutoplasmic

inclusions (dead) containing yolk, fat or oil, glycogen or starch, and pigment when not united with mitochondria; (3) ground protoplasm or cytoplasm (living). This classification is particularly true of embryonic or indifferent cells and other cells containing many secondary formations derived from various sources in the differentiation of the cell. He also gives the nomenclature of cell division, saying that every cell undergoes the process of karyokinesis which involves the division of the chromatin: dictyokinesis which involves the division of the Golgi apparatus; chondrokinesis, the division of the mitochondria. All three processes are preceded by the division of the centrosome, which is possibly stimulated to divide by the nucleus and is therefore called "centrokinesis." He describes at length the various inclusions of the cells emphasizing their morphological distinctions, their chemical constitution, and also tabulates the chemical and staining tests for these cytoplasmic and deutoplasmic inclusions. Formal metallic methods for detecting cell inclusions have a future before them. The chromeosmium tetroxide fixatives at present give the best results, but great improvement in the manufacture of microscopic lenses is necessary.—*Julia Moesel Haber.*

122. Levine, Michael. Life history and sexuality of Basidiomycetes. [Rev. of: Bensaude, Mathilde. Recherches sur le cycle évolutif et la sexualité chez les Basidiomycétes. *156 p., 13 pl., 30 fig.* Nemours, 1918. (See Bot. Absts. 3, Entry 347.)] Bot. Gaz. 68: 67–68. 1919.

123. Mirande, Marcel. Sur la formation cytologique de l'amidon et de l'huile dans l'oogone des Chara. [Formation of starch and oil in the egg of Chara.] Compt. rend. Acad. Sci. Paris 168: 528–529. 1919.—The cytoplasm of the young egg of *Chara* is crowded with mitochondria. Numerous clear vesicles appear, which enlarge greatly, forcing the mitochondria into dark staining lines around the clear areas. Starch grains appear in the vesicles and the result in the mature egg is a "mitochondrial pseudo-parenchyma" in which the starch grains are embedded. The mitochondria are the primordia of amyloplasts.—Oil appears in the young egg as minute droplets, which increase in size as the egg matures. In the older stages the drops occur in the meshes of the "mitochondrial pseudo-parenchyma." They are not the products of special mitochondria, and may be secreted by the amylogenes themselves. —*F. B. Wann.*

124. Molisch, Hans. Das Plasmamosaik in den Raphidenzellen der Orchideen Haemaria und Anoectochilus. [Plasma mosaic in raphid cells of the orchids Haemaria and Anoectochilus.] Sitzungsber. K. Akad. Wiss. Wien (Math.-Nat. Kl.) 126: 231–242. *Pl. 1.* 1917.

125. Putterill, Victor Armsby. Notes on the morphology and life history of Uromyces Aloes Cke. South African Jour. Sci. 15: 656–662. *Pl. 22–23, fig. 1–6.* 1919.—See Bot. Absts. 4, Entry 1153.

126. Small, James. The origin and development of the Compositae. Miscellaneous topics. New Phytol. 18: 129–176. *Fig. 64–78.* 1919.—See Bot. Absts. 5, Entry 720.

127. Stålfelt, M. G. Über die Schwankungen in der Zellteilungsfrequens bei den Wurzeln von Pisum sativum. [Variations in the frequency of cell division in the roots of Pisum sativum.] Svensk. Bot. Tidskr. [Stockholm] 13: 61–70. 1919.—See Bot. Absts. 5, Entry 945.

FOREST BOTANY AND FORESTRY

Raphael Zon, *Editor*
J. V. Hofmann, *Assistant Editor*

128. Agan, Joseph E. Brazilian fibers. Bull. Pan-American Union 50: 394–404. *4 pl.* 1920.—Seven fibers of importance are discussed briefly. These are "Piassava," from the bark of the palms *Attalea funifera* Mart. and *Leopoldina piassaba* Wall. This fiber is now used in the United States for the manufacture of snow sweepers for street cars. "Piteira"

is obtained from the leaves of *Fourcroya gigantea* Vent. "Aramine" or "Guaxima Roxa," from the trunk of *Urena lobata* L., is used in making bags. *Hibiscus canabinus* L. furnishes another fiber of value for manufacturing bags. *Sida rhombifolia* L. and *S. cordifolia* L. furnish good fiber, but the wild plants are small with crooked branches. "Gravata" (*Ananas sagenaria* Schult.) and "Gravata de Gaucho" (*Bromelia karatas* L.) are also common. The possibilities of growing and of using these fiber plants are discussed.—*G. R. Bisby.*

129. Andrews, Eliza F. **Oddities in tree stems.** Amer. Forest. 25: 1476–1478. *7 fig.* 1919.

130. Anonymous. "**Black bean**" or "**Moreton Bay chestnut.**" Australian Forest. Jour. 2: 14, 19. 1919.—A brief account of the silvical characteristics of *Castanospermum australe* A. Cunn.—*C. F. Korstian.*

131. Anonymous. **Blackboy and its commercial uses.** Australian Forest. Jour. 2: 178. 1919.—A brief note on *Xanthorrhoe preissii* of Western Australia. This species yields a resinous powder which, when heated, forms lumps known locally as "blackboy gum," from which glucose, treacle, scents, alcohol, picric acid and certain tar products, and from these latter again two dyes have been obtained.—*C. F. Korstian.*

132. Anonymous. **A complete wood preserving plant mounted on cars.** Sci. Amer. Supplem. 88: 332–333. *4 fig.* 1919. [From the *Railway Age.*]

133. Anonymous. **Gathering chicle gum for American gum chewers.** Sci. Amer. Supplem. 88: 172. *3 fig.* 1919.—Describes the process of obtaining chicle gum from the naseberry (*Achras sapota*), a tree of Central and tropical South America.—*Chas. H. Otis.*

134. Anonymous. **Grass tree fibre.** Australian Forest. Jour. 2: 175. 1919.—A brief note on the kingia grass tree which at present is used mainly in manufacturing coarse brooms and brushes, but which is believed to possess qualities making it suitable for insulating material for freezing works.—*C. F. Korstian.*

135. Anonymous. **Hints on storing timber to prevent decay.** Sci. Amer. 120: 359–360. 1919.

136. Anonymous. **Kiln drying oak for vehicles.** Sci. Amer. 120: 343. 1919.

137. Anonymous. **Laboratory tests in built-up wood.** Sci. Amer. 121: 606. 1919.

138. Anonymous. "**Napoleon willow**" **dying.** Amer. Forest. 24: 1414. *1 fig.* 1919.

139. Anonymous. **New uses for balsa wood.** Sci. Amer. 121: 559. 1919.

140. Anonymous. **Preparing cork for shipment.** Sci. Amer. Supplem. 88: 200–201. *3 fig.* 1919.

141. Anonymous. **Steaming of vehicle stock during kiln drying.** Sci. Amer. 120: 360. 1919.

142. Anonymous. **Valuable wandoo.** Australian Forest. Jour. 2: 213. 1919.—A brief note on characteristics of *Eucalyptus redunca.*—*C. F. Korstian.*

143. Anonymous. **Western Australian tuart.** Australian Forest. Jour. 2: 174–175. 1919. —A note on the characteristics of *Eucalyptus gomphocophala. C. F. Korstian.*

144. Anonymous. **What are naval stores?** Sci. Amer. 121: 328. 1919.

145. Anonymous. **Holztrocknung durch kalte Luft.** [The drying of wood by means of cold air.] Naturwissenschaften 7: 353. 1919.—A review of an article appearing in the Quarterly Journal of Forestry.—*Orton L. Clark.*

146. Anonymous. **Un bon exemple à suivre.** [A good example to follow.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 55–56. 1919.—The city council of Épinal on May 3, 1919, adopted a resolution urging that the fines for forest trespass provided by Article 192 of the Code forestier be increased and that the penalty of imprisonment be restored, at least to the extent of making it optional in the case of habitual offenders. The example set by Épinal should be widely followed and every effort made to secure legislation which will more adequately protect the forests, particularly in the vicinity of cities.—*S. T. Dana.*

147. Anonymous. **Ce que valent les chênes sur pied.** [Oak stumpage values.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 53–55. 1919.—Stumpage prices of oak timber in eastern France have approximately doubled since 1916, while the prices of many other commodities are three or even four times what they were before the war. Taking into account the decreased purchasing power of money, oak stumpage, in spite of the apparent increase in price, is worth relatively less than it was a few years ago. Owners of timber of good quality would therefore do well to hold it for the further increase in price which is sure to take place.—*S. T. Dana.*

148. Anonymous. **La forêt de Haguenau (étude d'un forestier française.** [A study of the forest of Haguenau.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 117–146. 1919.—The historic forest of Haguenau, owned jointly by the State and the city of Haguenau, comprises an almost unbroken expanse of 13,699 hectares in northern Alsace between the Rhine and the Vosges. It is situated on a practically level plain with a heavy, impermeable clay subsoil, generally overlain with a mixture of sand and clay in varying proportions. The area as a whole is cold, poorly drained, and in spots marshy. The continuity of the forest, which has decreased comparatively little in size since the middle ages, is doubtless due to the fact that the soil is in general unsuitable for cultivation. Injuries from frost, snow-break, and windfall are not uncommon and are at times severe. There is also more or less damage from animals (chiefly deer), insects (chiefly May beetles), various fungi, and, rarely, fire. Scotch pine forms 50 per cent of the stand, oak 30 per cent, hornbeam 8 per cent, and beech 6 per cent. Scotch pine grows rapidly up to 70 or 80 years of age, and ordinarily reaches maturity at about 120 years, with a height of from 28 to 30 metres and a diameter of 60 centimeters. It accommodates itself to all except the most marshy sites; is ordinarily rather poorly formed, but produces wood of excellent quality; and forms rather open stands which at maturity seldom have more than 200 trees per hectare. Seed years occur annually after 50 years of age with particularly heavy crops every 3 or 4 years. Oak, which formerly occupied a much more important place in the forest, thrives best in the alluvial soils along stream bottoms and produces a fine-grained wood which is much sought after, particularly for ship-building. Although it often attains a much greater age, it ordinarily matures at from 150 to 180 years with a height of from 25 to 30 meters and a diameter of 70 centimeters to 1 meter. Seed crops, which are much less frequent than formerly, occur at intervals of approximately 7 years, with full crops not oftener than once in 50 years. Hornbeam is of little value except as a filler and is often more or less of a weed tree. Beech was formerly much more abundant than at present, but has been increasing in importance again since 1870 because of its frequent use by the Germans for underplanting with pine and oak. Herbaceous vegetation is generally abundant, some times to the extent of interfering with reproduction, and local residents derive a considerable revenue from the abundant crops of whortleberry. The forest is more or less burdened with rights of use, most of which date back to time immemorial, and considerable damage has been done to the soil by the constant removal of the hardwood leaf litter. Transportation facilities and markets are good.—Prior to the seventeenth century, the forest of Haguenau appears to have been regarded as chiefly valuable for pasturage. The first real attempts at forest regulation were made in 1695, and it was not until 1845 that a complete

and systematic plan of forest management was put into effect. This plan was followed until after the Franco-Prussian war, when, in 1874, it was revised by the German foresters. The latter completely reorganized the division of the forest into blocks, compartments, and subcompartments; determined on the management of the entire area as high forest (nearly 7 per cent had been handled by the French as coppice under standards); fixed the rotation for Scotch pine at 70 to 120 years, and for oak at 160 years; and arranged the cutting series so as to progress against the direction of the prevailing winds. Natural reproduction by the shelterwood system, which was almost uniformly used by the French, was at first employed by the Germans as well, but was gradually abandoned in favor of artificial reproduction. During the last years of German management Scotch pine was reproduced almost entirely by direct seeding in strips, supplemented when necessary by planting; while oak was reproduced chiefly by the planting of 3-year-old transplants, and occasionally by direct seeding in strips. Thinnings were practised every 7 to 10 years, frequent and moderate thinnings being preferred to less frequent and heavier ones. In the judgment of the French foresters the Germans tended to favor too dense a stocking, both at the establishment of the stands and later. Underplanting of beech, chiefly to improve soil conditions, was common, wild seedlings generally being used for the purpose. A few of the best trees (from 15 to 25 per hectare) were nearly always reserved at the final cutting for the production of large-sized material. The practice of selling stumpage, which had been followed by the French, was superseded under German management by logging by the forest administration. The net revenue from the forest increased from 44 francs per hectare in the period from 1889 to 1900 to 57 francs in 1912–1914 and to 120 francs in 1915–1918. The recent war led to the turpentining by the Germans of the Scotch pine. The total cut remained about the same but the proportion of pine increased while that of oak decreased. Thinnings were neglected, stock accumulated in the nurseries, and the regeneration of cut-over areas did not keep pace with the cuttings. On the whole, however, the war did not seriously interfere with the management of the forest which is still in good condition.—*S. T. Dana.*

149. Anonymous. **Historique d'une coupe.** [History of a cutting area.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort **13**: 51–53. 1919.—In 1844 steps were taken to convert a cutting area of 7.23 hectares, chiefly oak with a little beech, in the communal forest of Corravillers on the borders of the Vosges, into coppice under standards. Since 1844 there have been three cuttings of standards at regular intervals of 25 years. The records show that the yields in fuel and bark secured from these successive cuttings have remained approximately constant. The transformation of the stand from pure coppice into coppice under standards has therefore been accomplished without loss in current yield, and the timber contained in the boles of the standards represents clear gain. As a result of the transformation the money value of the yield has increased from 460 to 680 francs per hectare. Still better results would have been obtained in a more moderate climate and a more fertile soil than that of the Vosges. —*S. T. Dana.*

150. Anonymous. **Notre domaine forestier et la guerre. (Extrait du Bulletin d'informations du G. Q. G.)** [Our forest domain and the war.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort **13**: 43–46. 1919.—The forest area of 600,000 hectares included in that part of France lying in the war zone suffered severely both as a result of battle and of its extensive exploitation by the French themselves and more particularly by the Germans. The latter not only used wood lavishly in the zone of operations but shipped considerable quantities back to Germany in order to save their own resources and to cripple France, which in 1913 imported 177,000,000 francs' worth of wood, for the post-war competition. Direct damages to the forests in the war zone are estimated roughly to amount to 1,400,000,000 francs, and indirect damages to 260,000,000 francs; while the forests in other parts of France also suffered serious damage because of the tremendous consumption necessitated by the war and by lack of tonnage. While the forests are recovering, France should meet its needs for wood, which are still great, by utilizing part of the enormous reserves offered by its colonies. The German possessions in the Kamerun, one of the most richly forested countries in Africa, will offer partial compensation for the devastation of the French forests caused by the war.—*S. T. Dana.*

151. Anonymous. Wattle and wattle growing. Australian Forest. Jour. 3: 45–46. 1920. —A note on the growing of various species of acacia and the products of the destructive distillation of black wattle wood.—*C. F. Korstian.*

152. Arias, Bernardo. Un sustituto del corcho. [A substitute for cork.] Revist. Agric. Com. y Trab. 2: 493–497. *3 fig.* 1919.—In this article attention is called to the tree *Ochroma lagopus* Sw. as a native tree valuable for planting because of the lightness of its wood, its rapid growth, medicinal properties and the wool or fiber in its fruits.—*F. M. Blodgett.*

153. Badoux, H. Die Waldreservationen in der Schweiz. [Forest reserves in Switzerland.] Schweiz. Zeitsch. Forstwesen 71: 2–4. 1920.—The policy for acquiring national forests was approved in 1906, and in 1910 three forest reserves were approved involving a total area of about 50 hectares. These areas were in effect leased by the government for periods of 25 and 60 years. The policy of the continuation of the forests was left to be determined when the period of lease expires. Some areas were paid up for the entire term, and others are paid by annual installments.—*J. V. Hofmann.*

154. Bailey, W. A. Artificial regeneration in sal forests. Indian Forester 45: 519–521. 1919.—Coppice overtops planted stock after cuttings in sal forests. To prevent this planting is now made about five years in advance of the opening of the stand giving the planted stock an opportunity to develop and become dominant at the start.—*E. N. Munns.*

155. Barbey, A. Les forêts suisse pendant la guerre. [The Swiss forests during the war.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 46–51. 1919.—Administration of the 982,000 hectares of forest lands in Switzerland, one-fourth of the total area of the country, is decentralized. Cantonal forests comprise 4 per cent of the forest area, communal forests 67 per cent, and private forests 29 per cent. There are no national forests, and the national forest service employs only 17 professional foresters. It contributes, however, to the salaries of the cantonal forest officers; supervises the use made of subsidies granted to the cantons; administers the federal forest law; provides technical instruction at the forest school at Zürich; and directs the forest experiment station.—At the outbreak of the war construction was automatically arrested and cutting materially decreased. After ten or twelve months, however, the foreign demand for timber and the native demand for wood fuel (due to the scarcity of coal), resulted in a steadily increasing cut. In 1916 wood exports, which before the war had been from 40,000,000 to 50,000,000 francs a year less than wood imports, exceeded the latter by 68,000,000 francs. The increased cut was accompanied by increased prices, fuel doubling and timber trebling in value in three years or less. Little or no overcutting took place in the public forests, but was more or less marked in the private forests, where advantage was taken of the extraordinary demand to improve the stands by the removal of many old reserves which before the war could not be marketed profitably. Strict supervision was exercised over all cuttings, a federal decree in 1917 requiring a permit for all cuttings of 20 cubic meters or more and fixing a fine of from 10 to 40 francs per cubic meter for all cuttings made without a permit. Moreover, measures were taken to maintain and if possible to increase the future productivity of the forest. For instance, in the Canton of Vaud, the number of inspectors was increased so that the average area under the supervision of each was reduced from 7,300 to 4,000 hectares. This example should be followed by other cantons as a means of increasing production and of rendering Switzerland independent of foreign supplies. An increase of only 1.1 cubic meters per hectare in the annual growth of the 600,000 hectares of communal forests would be sufficient to wipe out the present deficit of 700,000 cubic meters, but this can hardly be expected as long as the average area under the supervision of a technical forester remains as high as 8,570 hectares.—*S. T. Dana.*

156. Beeson, C. F. C. Food plants of Indian forest insects. Part IV. Indian Forester 45: 488–495. 1919.—A continuation of previous work. Forty-four species of three families are listed with the plants attacked by each.—*E. N. Munns.*

157. Berry, James B. **Wood famine imminent.** Georgia State Coll. Agric. Bull. 187. *4 p., 4 fig.* 1920.—This bulletin notes that the acme of wood production was reached in Georgia in 1909, with the cutting of a billion board feet. Since then there has been a gradual falling off in production.—*T. H. McHatton.*

158. Biolley, H. **Betrachtungen über die Wirtschafts-Einrichtung der Waldungen in der Schweiz. (Bemerkungen zu den Studien des Herrn. Dr. Ph. Flury.)** [Observations concerning improvement of forest management in Switzerland. Remarks on Dr. Ph. Flury's studies translated from the Journal of Forestry of Perret, Couvêt.] Schweiz. Zeitschr. Forstwesen 71: 37–49. 1920.—Forestry is divided into two groups, one based on practical experience and the other on biological principles. Emphasis is placed on the fundamental biological studies to be used as a basis for all forest practice. The practical concerns itself too much with the present production, and one part of a forest may be left unproductive due to over maturity while another is exploited during its growing period. Among the first essentials for improvement are definite forest boundaries, compartments; definite volume and growth tables and cutting cycles based on accurate local growth figures. The relation of density of stand and increment must be correlated with cutting periods in order to secure continuous production. The principal points recommended for the improvement of the forest are: every acre must reach its maximum production; production as influenced by stand, site, species, etc., must be determined locally; species to be used and care required; improvement for regulation only should be reduced to a minimum. All changes in forest management should be based on thorough scientific research.—*J. V. Hofmann.*

159. Bontrager, W. E. **What shade and ornamental trees shall we plant?** Monthly Bull. Ohio Agric. Exp. Sta. 5: 35–41. *5 pl.* 1920.—See Bot. Absts. 5, Entry 1798.

160. Bouvet, Schaeffer, and others. **Congrès de 1919.** [Congress of 1919.] Bull. Trimest. Soc. Forest. Franche-Comté et Belfort 13: 72–109. 1919.—The first meeting of the Society since the outbreak of the war was held at Strassburg, August 3 to 6, 1919. In connection with the rejoicing over the recovery of the "lost provinces," attention was called to the flattering comments regarding French methods of forest management in Alsace-Lorraine which were made by German foresters after the war of 1870. Field trips were made to the forests of Haguenau, Hoh-Koenigsburg, Sainte-Odile, Hohwold, Haslach and Nideck, brief descriptions of the character and management of which are given.—*S. T. Dana.*

161. Brown, W. H., and A. F. Fischer. **Philippine forest products as sources of paper pulp.** Forest. Bur. Philippine Islands Bull. 16: *13 p. Pl. 1.* 1918. (1919).—A general consideration of the bamboos, coarse grasses such as *Imperata exaltata* and *Saccharum spontaneum*, various fiber plants, and some trees as potential sources of paper pulp.—*E. D. Merrill.*

162. Brown, W. H., and A. F. Fischer. **Philippine mangrove swamps.** Forest. Bur. Philippine Islands Bull. 17: 1–132. *47 pl.* 1918.—A general consideration of the mangrove swamps, their constituent species, and economic products. Keys and descriptions are given to all species, as well as local names, etc. The illustrations, chiefly photographic, are excellent. In addition to general mangrove scenes each individual species is illustrated. The economic discussion includes data on stand, cultivation, firewood, tanbark and dyes, with a discussion of the nipa palm and its uses.—*E. D. Merrill.*

163. Brown, W. H., and A. F. Fischer. **Philippine bamboos.** Forest. Bur. Philippine Islands Bull. 15. *32 p. Pl. 1–33.* 1918.—See Bot. Absts. 5, Entry 1015.

164. Brunnhofer, A. **Berufsfragen.** [Questions of professional forestry.] Schweiz. Zeitschr. Forstwesen 71: 4–6. 1920.—A discussion of the relation of technical and commercial forestry. A separation of the two phases is condemned on the basis that the technical forester must be familiar with the commercial phases in order to practice his profession intelligently, and the commercial man must take technical forestry into consideration in utili-

zation and harvesting, otherwise the scientific phase, which aims at continuous production, will be defeated. For these reasons a forester in either field must have a good knowledge of the other field, and the best interests of forestry will be served by keeping the two phases combined and making up the deficiency of men by reducing the areas under each forester and furnishing him with an assistant.—*J. V. Hofmann.*

165. Burkill, I. H. **The composition of a piece of well-drained Singapore secondary jungle thirty years old.** Gardens' Bull. Straits Settlements 2: 145–157. 1919.—See Bot. Absts. 4, Entry 280.

166. Burrow, Gordon. **Reproduction of cypress pine.** Australian Forest. Jour. 2: 91–92. 1919.—A note on the factors governing the reproduction of this species. The author is convinced that a good seeding season and a good growing season are co-essentials. A good seed crop is dependent upon sufficient precipitation to set and nourish the young cones and bring them to maturity. Drought, rabbits, and fire are serious enemies of young reproduction.—*C. F. Korstian.*

167. Champion, H. G. **Observations on some effects of fires in the chir (Pinus longifolia) forests of the West Almora Division.** Indian Forester 45: 353–364. *1 pl.* 1919.—Examinations of burned areas after a fire show damage cannot be estimated until several months later. Insects for some unknown reason did not appear in large numbers after fire in mature stands though death continues afterward, which may be due to a destructive fungus. Damage by fire may be as much due to heat-killing as flame itself. In young trees damage bears an inverse ratio to height, the smaller the tree the greater the loss. On reproduction, fire appears to have a beneficial effect, probably due to reduced competition, food or soil water. Fire in mixed stands operates to thin out the chir and increase oaks and other trees.—*E. N. Munns.*

168. Chapman, H. H. **A program for private forestry.** Amer. Forest. 25: 1405–1406. 1919.

169. Claudy, C. H. **Economic tree murder. How we are denuding our forests to supply Europe while she is conserving her own timber.** Sci. Amer. 121: 132. 145. 1919.

170. Cook, O. F. **Olneya beans.** Jour. Heredity 10: 321–331. *Fig. 13–17.* 1919.—See Bot. Absts. 4, Entry 549.

171. Cremata, Merlino. **Algo sobre nuestros bosques. [Forest preservation.]** Revist. Agric. Com. y Trab. 2: 610–611. 1919. An article of forest conditions in Cuba and on forest preservation.—*F. M. Blodgett.*

172. Crevost, C., and C. Lemarie. **Plantes et produits filamenteux et textiles de l'Indochine. [Fiber- and textile-producing plants of Indo-China.]** Bull. Econ. Indochine 22: 813–837. *Pl. 2.* 1919.—See Bot. Absts. 5, Entry 1122.

173. Dana, S. T. **National forests and the water supply.** Amer. Forest. 25: 1507–1522. *33 fig.* 1919.

174. Danielsson, Uno. **Naturskydd i Södra Kalmar län. [Protection of natural beauty in southern Kalmar (Sweden).]** Skogen 6: 17–22. *5 fig.* 1919.

175. Darnell-Smith, G. P. **Dry rot in timber.** Australian Forest. Jour. 2: 314–316. 1919.—A brief discussion of the characters of some dry rot fungi and measures for their control. Creosote and tar are effective, but their odor and color restrict their use. Boric acid and magnesium fluosilicate are strongly recommended. Wood-preserving oil, prepared from kerosene shale, is effective if the ventilation is good.—*C. F. Korstian.*

176. Darvey, Mason. **Forest tree planting in Nelson District.** New Zealand Jour. Agric. 19: 297–299. 1919.—It is believed that *Pinus insignis* and several species of Eucalyptus may be planted on land costing about $50 an acre as a very profitable long term investment.—*N. J. Giddings.*

177. Dawkins, C. G. E. **Yemané (Gmelina arborea) in Upper Burma.** Indian Forester 45: 505–519. 1919.—The results of trials to introduce the yemané into the forests of Burma are given. Three methods have been tried; broadcast sowing, dibbling and field planting. Notes on the growth of plantations made are given.—*E. N. Munns.*

178. De Jong, A. W. K. **Tapproeven bij Hevea brasiliensis.** [Tapping experiments on Hevea brasiliensis.] Arch. Rubbercult. Nederlandsch-Indië 3: 277–278. 1919.—Tapping a quarter, a third or half the circumference of the tree with one left hand cut gave the following results:

	PROPORTION OF THE RUBBER YIELDS FOR		
	¼ of the C.	⅓ of the C.	½ of the C.
For the first area tapped	100	117	140
For the second area tapped	100	116	135.5
For the third area tapped	100	109.5	100
For the three areas tapped	100	114	122

—*W. E. Cake.*

179. Demorlaine, J. **La nécesitaté d'un service forestier d'armée sous l'ancien régime.** [The need for an army forest service.] Rev. Eaux et Forêts 57: 229–230. 1919.—Duhamel du Montceau, in 1764, in his "Exploitation des Bois," pointed out the need of attaching forest officers to the engineers crops of the army in order to prevent the serious damage done to the forests when the timber and other forest products needed by the army were secured by ordinary soldiers without technical supervision. The need of an army forest service of this sort has been strikingly demonstrated by the great war. Such a service should be autonomous, with the same standing as the Engineer or Quartermaster Corps, and should direct the formation, management, instruction, and organization of companies of mobilized foresters.—*S. T. Dana.*

180. Descombes, Paul. **Installation d'expériences prolongées sur le ruissellement.** [Protracted experiments upon stream-flow.] Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 17–35. *2 fig.* 1918.—The author gives a brief résumé of methods adopted by L'Association Centrale pour l'Aménagement des Montagnes in studying the relations between precipitation and stream-flow in the drainage basin of the Arises. An apparatus for automatically gauging and recording changes in stream level is described. Data are presented to indicate a correlation between changes in the flow of the Ariège (1896–1910) and the sylvo-pastoral conditions in its drainage basin.—*I. W. Bailey.*

181. Descombes, Paul. **Le reboisement et le développement economique de la France.** [Reforestation and the economic development of France. Mém. Soc. Sci. Phys. Nat. Bordeaux VII, 2: 103–217. *2 fig.* 1918.—Deforestation and over-grazing in the uplands of France prevent an extensive substitution of waterpower for coal and are considered to be responsible for the depopulation and degradation of these regions. Reforestation and other remedial projects for improving the range have been combated by the mountaineers, who fear curtailment of their herds and flocks. L'Association Centrale pour l Aménagement des Montagnes has conducted a series of extensive experiments to prove that it is possible to prevent overgrazing and to reforest the mountains without reducing the live stock of the mountaineers. This is done by excluding from the alpine pastures migratory herds and flocks from the lowlands. In considering measures for reforestation of both uplands and lowlands the author

devotes considerable attention to a discussion of the status of French forests and the reforestation movement during the nineteenth century, and quotes various legislative enactments at length. The paper contains much statistical information.—*I. W. Bailey.*

182. De Vries, O. **Over de bruikbaarheid van instrumenten als metrolac en latexometer voor het bepalen van het rubbergehalte van de latex.** [**On the use of hydrometers (metrolac and latexometer) to determine the rubber content of latex.**] Arch. Rubbercult. Nederlandsch-Indië 3: 207–221. 1919.—Very large differences may occur between the real rubber content of Hevea latex as determined by actual coagulation and the figures obtained from the hydrometric specific gravity readings. The metrolac and latexometer are constructed for a special case, perhaps an original latex of 37½ per cent rubber content and 0.9775 specific gravity or some other combination near there, when the specific gravity of the original serum varies from 1.022. When such a latex is diluted with water the reading of the instrument is correct, but for latices of other composition the rubber content cannot be determined by these instruments. In general on the estates in Java the results obtained by hydrometric readings are too low, usually giving values between 70 and 80 per cent of the real content.—*W. E. Cake.*

183. De Vries, O. **Verband tusschen het soortelijk gewicht van latex en serum en het rubbergehalte van de latex.** [**The relation between the specific gravity of latex and serum and the rubber content of latex.**] Arch. Rubbercult. Nederlandsch-Indië 3: 183–206. 1919.—The relation between the specific gravity of Hevea latex and its rubber content was determined in the following five cases: (1) continued tapping after a period of rest, (2) light or heavy tapping systems, (3) pollarding, which also acts as a "heavier stress," (4) periods of rest and shallow tapping, and (5) individual trees. In all cases the results are the same, showing that the specific gravity is inversely proportional to the rubber content. The actual specific gravity of the latex is determined by the proportion o the rubber and serum (i.e., the rubber content of the latex) and only to a small extent by the specific gravity of the serum which remains nearly constant.—*W. E. Cake.*

184. De Vries, O., and W. Spoon. **Variabiliteit van plantage-rubber.** [**Variability in plantation-rubber.**] Arch. Rubbercult. Nederlandsch-Indië 3: 246–276. 1919.—Data from the Central rubber station comparing the tensile strength, slope, rate of cure, and viscosity of moked sheet and crepe rubber for the years 1917 and 1918. The principal causes for deviation and variability in properties are pointed out.—*W. E. Cake.*

185. Essig, E. O. **New hosts of oak-root fungus in Humboldt County.** Monthly Bull. Comm. Hortic. California 8: 79–80. 1919.—See Bot. Absts. 4, Entry 1170.

186. F[oster], J. H. [Rev. of: Rankin, W. Howard. **Manual of tree diseases.** *398 p.* Macmillan Co.: New York, 1918.] Jour. Forest. 17: 321. 1919.

187. Geete, Erik. **Ur timmersaxens historia.** [**From the history of the timber "grab hook."**] Skogen 6: 23–25. *3 fig.* 1919.

188. Gellatly, F. M. **Investigatory work needed: relation of commonwealth to states.** Australian Forest. Jour. 2: 137–139. 1919—The more important benefits to be derived from a forest products laboratory are discussed. Urgent need is voiced for research along the following lines: (1) tests of pulping and paper-making qualities of indigenous woods and materials, (2) distillation tests to determine the tar oil, gas, acid and other properties of commercial value in indigenous woods, (3) investigation of the chemical and commercial properties of gums, kinos, resins, and saps.—*C. F. Korstian.*

189. Grinndal, Th. **Tidig eller sen skogssådd?** [**Early or late forest sowing?**] Skogen 6: 124–127. 1919.

190. Gupta, B. L. **New Indian species of forest importance.** Indian Forester 45: 388–392. 1919.—A continuation of previous work (*Ibid.* 43: 132. 1917). The present list includes 48 species recently described from India, bringing the total forest species up to 393.—*E. N. Munns.*

191. Haines, H. H. **Indian species of Carissa.** Indian Forester 45: 375–388. *Pl. 17–20, fig. 1–7.* 1919.

192. Hall, Cuthbert. **On a new species or form of Eucalyptus.** Proc. Linnean Soc. New South Wales 43: 747–749. *Pl. 75.* 1918.

193. Heck, G. E. **Splintering of airplane woods.** Sci. Amer. Supplem. 88: 68–69. *4 fig.* 1919.

194. Heim, A. L. **Airplane propeller manufacture.** Sci. Amer. Supplem. 88: 162. 1919. —Considers problems of manufacture which have been or need to be studied.—*Chas. H. Otis.*

195. Hoffman. **Ist die Vergesellschaftung im Forstbetriebe möglich?** [Is socialization of forest industry practicable?] Forstwiss. Centralbl. 41: 210–226. 1919.—Most socialists agree that forest industries of Germany should be socialized, in order to avoid danger of monopoly, to insure continuity of employment and of supplies of forest products, and to insure maximum sustained production at lowest cost. Methods suggested are State ownership, either by purchase or confiscation, syndicalization, or division of large holdings. State ownership is unnecessary because the State already owns a sufficient proportion of the forests to prevent monopoly, and undesirable because of the probable decrease in efficiency due to bureaucratic inert a and political influences. Moreover, it is financially impossible. Syndicalization is not desirable because the nature of the business is not adapted to this form of management. Division of holdings is contrary to the requirements of efficient forest production, and unnecessary anyway because there are few very large holdings. The best way for a democratic state to control forest production is by use of its powers of taxation. The forest law should require that all forest tracts of more than 100 hectares be managed according to a working plan, under technical supervision. Beyond this, the owner should have entire freedom of action. Owners of smaller tracts should form cooperative bodies or looser associations, in order to be able to take steps toward more efficient management. The State should supervise the activities of these associations.—*W. N. Sparhawk.*

196. Horne, W. T. **Oak-fungous, oak-root fungus disease, fungus root-rot, toadstool root-rot or mushroom root-rot.** Monthly Bull. Comm. Hortic. California 8: 64–68. *Fig. 36–39.* 1919.—See Bot. Absts. 4, Entry 1176.

197. Hubault, E. **L'après guerre dans les îles britanniques: projets de reconstitution forestière.** [Forest reconstruction in Great Britain.] [Rev. of: **Final Report of Forestry Subcommittee, Reconstruction Committee, Ministry of Reconstruction.** *105 p.* 1918.] Rev. Eaux et Forêts 57: 213–228. *1 fig.* 1919.—The critical situation in which Great Britain found itself during the war as a result of totally inadequate native wood supplies has led to the formulation by a specially appointed committee of a comprehensive forestation program, intended to decrease materially Great Britain's present dependence on other countries and to provide a reserve capable, in case of war, of meeting for three years all its needs for wood at a rate of cutting five times as great as the normal annual consumption. The program contemplates the establishment in 80 years of 717,000 hectares of coniferous plantations, chiefly Scotch pine, European larch, Douglas fir, Sitka Spruce, Norway Spruce, and western red cedar. Two-thirds of this area, or 478,000 hectares, will be forested during the first 40 years, and 101,000 hectares during the first ten years. Of this latter area, the state will itself acquire, either by purchase or lease, and plant 60,000 hectares; it will associate itself with communities and individuals in the cooperative planting and management of 10,000 hectares; and through the granting of subsidies of one kind or another it will encourage the forestation of 10,000 hectares by communities and individuals. The remaining 21,000 hectares are to be secured through the voluntary or forced reforestation by their owners of areas cut clear during the war. In addition the reforestation during this period of 4,000 hectares of hardwoods (and eventually of 8,000 hectares) is contemplated. The committee proposes certain reductions in forest taxes and in freight rates for forest products, the systematic training of both

higher and lower forest officers, and the establishment of adequately equipped forest experiment stations. The carrying out of this program, the cost of which during the first 10 years is estimated at 84,162,000 francs, is to be entrusted to an independent forest commission consisting of three salaried and three non-salaried members, and having attached to it three subcommissioners, ten or eleven divisional officers, and fifty or fifty-five forest officers. From the French point of view the most characteristic feature of the program is the fact that particular care is taken to prevent the state, in spite of the important part played by it, from encroaching on the rights of private owners, and to encourage, rather than to force, coöperation on the part of the latter.—*S. T. Dana.*

198. Illick, J. S. **When trees grow.** Canadian Forest. Jour. 15: 351–354. 1919.—A series of studies carried out for several years involving daily measurements on 200 trees during the growing season lead to conclusions that: (a) Trees grow almost twice as fast during the night as during the day; (b) The growing season for white pine and Norway spruce, in Pennsylvania at least, is ended by July 1st; (c) Such knowledge is of high utility in choosing season for planting trees.—*H. C. Belyea.*

199. Iwaki, Takanori. **Microscopical distinctions of some Japanese coniferous woods.** [Article in Japanese.] Bot. Mag. Tôkyô 32: 187–198, 219–237. 1918.—See Bot. Absts. 4, Entry 1299.

200. Jauffrat, Aimé. **La détermination des bois de deux Dalbergia de Madagascar, d'aprés les caractéres de leurs matiéres colorantes. [Identification of wood of Dalbergia by staining reactions.]** Compt. Rend. Acad. Sci. Paris 168: 693–694. 1919.—See Bot. Absts. 5, Entry 565.

201. Jolly, N. W. **The importance of the wood pulp industry to Australian forests.** Australian Forest. Jour. 2: 9. 1919.—The possibility of Australia manufacturing wood pulp from its own forests is discussed. The author advocates the utilization of hardwood and *Pinus insignis* saplings and poles for wood pulp as a means of utilizing waste or of rendering thinnings profitable.—*C. F. Korstian.*

202. Jones, J. **Shea butter tree.** Imperial Department of Agriculture for the West Indies. Report on the Agricultural Department, Dominica, 1918–19: 3. 1919.—Nuts from Dominica examined at the Imperial Institute, London, were found to contain 44 per cent. of fat, a somewhat lower percentage than that contained in West African nuts.—*J. S. Dash.*

203. Khan, A. Hafiz. **Red wood of Himalayan spruce (Picea morinda).** Indian Forester 45: 496–498. *1 pl.* 1919.—The water absorptive capacity of the red wood which occurs in the heart of *Picea morinda* is less than that of the white wood, while it is at the same time heavier, volume for volume, than white wood. Both colored woods are lighter than water. —*E. N. Munns.*

204. Koehler, A. **Selecting wood for airplanes.** Sci. Amer. Supplem. 88: 148–149. *5 fig.* 1919.

205. Lantes, Adelaide. **El alamo. [The pipal tree.]** Revist. Agric. Com. y Trab. 2: 612–613. *3 fig.* 1919.

206. La Touche, T. H. D. **The submerged forest at Bombay.** Rec. Geol. Surv. India 49: 214–219. *Pl. 17–19.* 1919.—During excavations in Bombay harbor in 1878 a submerged forest with many stumps in situ was found over an area of 30 acres. The trees were embedded in stiff blue clay 6 to 20 feet thick, resting on decomposed basaltic rock, and covered with 4 to 5 feet of harbor silt. The deepest stumps were rooted 33 feet below the present mean high tide. Most of the wood was identified as *Acacia catechu*, but two apparently drift logs were teak (*Tectona grandis*). In 1910 excavations on an adjacent area disclosed more stumps,

some rooted 40 feet below high tide. The conclusion is that there has been gradual depression of a forested rocky coastal plain, forming quiet lagoons in which the trees became embedded in the clay; then a tilting movement brought in the open sea, and *Teredo* bored the trunks, causing them to break off at the clay surface.—*Winfield Dudgeon.*

207. Lindberg, Ferd. **Då skogen snoar in.** [When the forest is snowed in.] Skogen 6: 128–132. *4 fig.* 1919.

208. Maas, J. G. J. A. **Gewijzigde methode voor veldproeven met Hevea.** [Other methods for field experimentation with Hevea.] Arch. Rubbercult. Nederlandsch-Indië 3: 233–237. 1919.—In this article the author sets forth a plan for the elimination of error due to the personal factor of the tapper in field experiments with *Hevea.* His plan is to have the tapping rows and collecting rows perpendicular to each other, so that each tapper taps a part of the trees of each collecting task.—*W. E. Cake.*

209. Maas, J. G. J. A. **Nog eenige kiemproeven met Hevea-zaden.** [Some more germination trials with Hevea seed.] Arch. Rubbercult. Nederlandsch-Indië 3: 237–243. 1919.—In preserving *Hevea* seed the packing material must be moist and not air tight. When *Hevea* seeds are to be preserved for longer than one month the packing material should be moistened every 3 or 4 weeks. At a temperature of 4 to 8°C. the seeds will stand a drier and more air-tight package better than at ordinary temperatures. Air-tight packages however cause them to lose their germinating power quickly. Merely ensilaging *Hevea* seed in the ground seems to be good for preserving the seeds on an estate for a short period like a month. Treatment with water at about 50°C. resulted in increased germination energy, and a slightly improved germination. Sprinkling with warm water at 45°C. increased the rapidity of germination a little but had practically no effect on the germination per cent.—*W. E. Cake.*

210. Mackay, H. **Conifers in Victoria.** Australian Forest. Jour. 2: 265–267. 1919.—Summary of a paper on "Coniferous plantations in Southeastern Australia," read before the first Inter-State Conference on Forestry, embodying the experience of that State in the establishment of exotic conifers over a period of 34 years. Thirteen conifers indigenous to North America are found in the list.—*C. F. Korstian.*

211. Mackay, H. **Treatment of indigenous hardwoods.** Australian Forest. Jour. 2: 19–20. 1919.—Extract from a paper read before the first Interstate Conference on Forestry at Sydney, November, 1911, in which the silvicultural management of eucalyptus forests is briefly discussed. Wherever the standing crop is fairly uniform in age and size, a clear cutting in sections, leaving, in addition to seed trees, only trees fit for piles and girders, is advocated.—*C. F. Korstian.*

212. Madelin, J. **Les cèdres du Liban.** [The cedars of Lebanon.] Rev. Eaux et Foréts 57: 275–276. 1919.—The cedars of Lebanon, formerly regarded by the natives as divine beings in tree form, flourish only at El-Herzé at an altitude of over 2200 meters. Some of them are over a hundred feet high and the largest is 3 feet in diameter. The few trees which still survive have suffered severely at the hands of tourists and should be protected from further damage.—*S. T. Dana.*

213. Main, J. M. **Eden and its timber resources.** Australian Forest. Jour. 3: 48–49. 1920.—A note on the forest resources adjacent to the town of Eden on the South Coast of Australia with a list of the principal timber species of eucalyptus and their uses.—*C. F. Korstian.*

214. Martin, Percy F. **Great forests of South America.** Canadian Forest. Jour. 15: 264–266. 1919.—Four types of timber are recognized: small scrubby forests of dry temperate or sub-tropical regions; good forests of Antarctic beech and a few conifers of temperate regions in the Andes; the fresh and salt-water swamps of mangroves and species with soft woods; the tropical rain forest of a great variety of hardwoods.—*E. N. Munns.*

215. Massias, J. **Les forêts de Grèce.** [The forests of Greece.] Rev. Eaux et Forêts 57: 237-247. 1919.—Prior to 1913 the forest area of Greece, excluding areas once forested but now devastated, amounted to some 800,000 hectares, or about 12 per cent of the total area of the country. Including the new provinces added by the war, the total forest area is about 13 per cent. Approximately 50 per cent belongs to the State, 20 per cent to convents and communes, and 30 per cent to private owners. Aleppo pine constitutes 35 per cent of the stands, Cephalonian fir 25 per cent, and various oaks 20 per cent. The value of the forest products harvested annually, including timber, fuel, charcoal, resin, forage, and other minor products, amounts to about 3,300,000 francs, of which nearly one-half is fuel.—All forests, both public and private, are theoretically subject to a forest regime in the department of Agriculture, but lack of personnel makes this control ineffective. Even in the State forests there are no real plans of management. These, as well as certain private forests, are heavily burdened with various rights of use which have resulted in serious damage, particularly through the unrestricted grazing of sheep and goats. The forests themselves are not subject to a land tax, but forest products (with certain exceptions, the most important of which is fuel harvested by the peasants for their own use) are taxed at varying rates according to the nature of the product and the character of the ownership. Recent laws aim to secure better fire protection, the reforestation of denuded lands, the codification and revision of existing rights of user, and improved management of all forest lands, both public and private. There are two schools for the training of guards and rangers and one (at Athens) for the training of higher forest officers.—*S. T. Dana.*

216. Mattoon, Wilbur R. **Making woodlands profitable in the Southern States.** U. S. Dept. Agric. Farmers Bull. 1071. *38 p. 55 fig.* 1920.

217. Mattoon, Wilbur R. **Treating fence posts on farm.** Louisiana State Univ. Div. Agric. Exp. Circ. 37. *20 p. 11 fig.* 1920.—Fence posts treated with creosote and set in the ground at Calhoun, Louisiana, in 1908 were examined after 10 years. Of the black gum posts, 97 per cent were sound; cypress, 96 per cent; tupelo gum, 88 per cent; sweet gum, 87 per cent; sap pine, 73 per cent; bay, 68 per cent. Methods of treating posts are also discussed. —*C. W. Edgerton.*

218. Miller, Robert B. **The wood of Machaerium Whitfordii.** Bull. Torrey Bot. Club 47: 73-79. *8 fig.* 1920.—A study is made of the wood of *Machaerium Whitfordii* Macbride, which came from Colombia. Color, density and other gross characters are given; it is related to the true rosewoods and is of commercial importance. It is diffuse porous, usually has uniseriate rays, storied arrangement of elements, small half-bordered pits between vessels and ray cells, and sieve-like perforations of pit membrane. Wood parenchyma is diffuse, paratracheal, and on the face of the summer wood.—*P. A. Munz.*

219. Morrison, W. G. **Natural afforestation in a New Zealand mountain area.** Australian Forest. Jour. 2: 380-384. 1919.—The first installment of a discussion treating the merits of natural regeneration by seed with particular reference to the indigenous forests of the Hanmer area. It is contended that natural regeneration ought to be accomplished at less than one-tenth the cost of relatively cheap planting methods. [See also next following Entry, 220.]—*C. F. Korstian.*

220. Morrison, W. G. **Natural afforestation in a New Zealand mountain area.** Australian Forest. Jour. 3: 23-25. 55-58. 1920.—A continuation and final installment of an article, the first part of which has been abstracted. The spontaneous reproduction of exotic shelter plantations on the Hanmer Plains is described. *Pinus radiata, P. pinaster, Betula alba, Quercus pedunculata* and *Larix europea* were found reproducing themselves from seed at rates varying from several hundred to tens of thousands per acre depending on the species, the distance from seed trees and site conditions. The mean annual rainfall for the years 1905 to 1918 is approximately 48 inches, which is well above the safety limit for successful planta-

tions. The author cites evidence to show that natural afforestation of the high country is feasible but suggests that on the more accessible waste areas it be augmented by artificial afforestation as now practiced. [See also next preceding Entry, 219.]—*C. F. Korstian.*

221. Nordstedt, C. T. O. [Swedish rev. of: Heribert-Nilsson, N. Experimentelle Studien uber Variabilität, Spaltung, Artbildung und Evolution in der Gattung Salix. [Experimental studies on variability, segregation, speciation and evolution in the genus Salix.] Lunds Universitets Arsskr. N. F. (Avd. 2.) 14^{23}: 1–145. *65 fig.* 1918.] Bot. Notiser 1919: 39–40. 1919.

222. Pearson, R. S. **Note on the mechanical strength and seasoning properties of Shorea robusta timber.** Indian For. Rec. 7: 120–145. 1919.—The results of tests on sal for transverse strain, compression, shearing and hardness are given in detail on timber felled at different times of the year, from different localities, and from trees of different origin. Data is also presented on the rate of seasoning of woods obtained under the same conditions as those described above.—*E. N. Munns.*

223. Petch, T. **The effect of time intervals in rubber tapping.** Dept. Agric. Ceylon Bull. 42. *8 p.* 1919.

224. Pierre, L. **Note sur l'Isonandra Krantziana (arbre à Gutta-Percha de la Cochinchine et du Cambodge). [Note on Isonandra Krantziana, a gutta percha tree of Cochinchina and Cambodia.]** Bull. Agric. Inst. Sci. Saigon 2: 33–40. 1920.—A report on the economic possibilities of the above species, this one probably being the form described by Pierre as *Dichopsis Krantziana.*—*E. D. Merrill.*

225. Raux, Marcel. **Une devise de politique forestière. [A motto of forest policy.]** Rev. Eaux et Forêts 57: 248–254. 261–274. 1919.—A comprehensive forest policy should include both a far-sighted administrative program and legislation necessary to make this program effective. The essence of such a policy can be expressed by the simple motto, "To create and to conserve." The State should take the lead in creating, not by the purchase of private lands already forested, but by the acquisition and reforestation, chiefly with native conifers, of lands now uncultivated or abandoned. These plantations, scattered throughout the country, would not only prove profitable financially, but would prove more effective in stimulating similar work on the part of other owners than any amount of literary propaganda. Reforestation by communities should be further encouraged by State loans, and the resulting plantations should be subject to the forest regime. Private owners and forestry societies should be given free advice and other assistance by the State, and plantations established by them should be granted liberal exemptions from taxation until they reach a certain height.—The conservation of privately owned forests, which constitute more than two-thirds of the forest area of France, is a matter of very real public concern and should therefore be undertaken by the State. Supervision of cuttings in such forests should be exercised by the State, without charge to the owner; while clear cuttings in protection forests should be prohibited, and in other forests should be followed by reforestation. As to clearings, legislation should be enacted providing that the forest area of France must not be diminished; prohibiting the clearing of all stands in the zone of protection forests; and requiring a permit from the Minister of Agriculture for the clearing of all stands outside of this zone. These measures would require an increased forest personnel, which could be secured in part by relieving forest officers of their duties as fish wardens. Supervision of private cuttings should also be facilitated by commissioning private forest guards as forest officers. Finally, conservation should be promoted by giving forest owners, both public and private, more adequate protection against trespass by increased penalties.—*S. T. Dana.*

226. Reynard, J. **Les arbres de la paix. [Trees of peace.]** Bull. Trimest. Soc. Forest Franche-Comté et Belfort 13: 111–112. 1919.—Trees should be widely planted as the simplest and most practical means of commemorating the peace treaty of Versailles. Better than anything else they serve to bind father to son, dead to living, generation to generation.—*S. T. Dana.*

227. Romell, Lars-Gunnar. **Sammanväxning och naturympning. [Growing together and natural grafting.]** Skogen 6: 133–141. *4 fig.* 1919.

228. Rumbold, Caroline. **The injection of chemicals into chestnut trees.** Amer. Jour. Bot. 7: 1–20. *7 fig.* 1920.—See Bot. Absts. 5, Entry 964.

229. Scheidter, Franz. **Das Tannensterben im Frankenwalde. [Death of firs in the Frankenwald.]** Naturw. Zeitschr. Forst- u. Landw. 17: 69–90. 1919.—The dying of firs in the State-owned Frankenwald, and also to a lesser extent in other middle-European forests, which has become gradually and only in recent years of alarming extent, is described in great detail. After dissertating upon various theories which have been advanced by other investigators, especially Neger, the writer states it as his own opinion that insects and fungi (the Hallimasch most commonly), are only secondary causes, and that the fundamental difficulty arises from the improper silvicultural system followed in the State forests. In these the effort seems always to have been to grow fir, and spruce-fir mixtures, in even-aged stands, whereas privately-owned forests, under similar conditions, are usually handled as all-aged or selection forests, a plan which is better adapted to fir. The opinion is advanced, and is backed by much evidence, that the rapid loss of fir in the Frankenwald is due primarily to crowding when the even-aged stands attain a certain age or density, being particularly marked where fir must compete with the broader-crowned spruce. In any event, in such stands, the lower limbs are lost very rapidly, and in the opinion of the writer, the small crown remaining at the top of the tree is then unable to draw to itself sufficient moisture for existence. The older needles die, then the growing tip succumbs, and death of the entire tree soon follows. Often, before death occurs, there is a vigorous production of "water-sprouts" on the lower portion of the stem. The evil is augmented by drought years, and by snow-damage and windfall which, by opening the canopy, apparently encourage the production of these "water-sprouts" and also cause drying of the soil, the growth of grass, etc. A horde of insects, and some of the most destructive fungi, attack the weakened trees, and of course hasten death and contribute to the aggregate losses. The suggested remedy is a system of management which will give the fir more ample space for its late development and maturing. This the selection system would appear to do.—*C. G. Bates.*

230. Schotte, Gunnar. **Meddelanden från Svenska Skogsvårdsforeningen.—Protokoll; fört vid Svenska Skogsvårdsföreningens årsmöte i Stockholm den 14 mars, 1919. [Proceedings at the annual meeting of the Swedish forestry association, Stockholm, March 14, 1919.]** Skogen 6: 217–224. 1919.

231. Secrest, Edmund. **Salient features of a forestry policy for Ohio.** Monthly Bull. Ohio Agric. Exp. Sta. 5: 15–19. 1920.—The depletion of forests cannot be permitted longer to escape public attention. Private ownership has failed to provide for renewal of forests after cutting. The effect of such a policy is very marked in small communities where certain phases of the lumbering industry have been the chief source of income. A state forestry policy is proposed whereby non-agricultural or idle lands may be purchased for reforestation purposes. Ohio has 500,000 acres of such land which should come under public ownership, or state or municipal custody. To encourage private owners to reforest waste lands the state should establish nurseries where planting stock could be obtained at the cost of production. —*R. C. Thomas.*

232. Show, S. B. **Climate and forest fires in northern California.** Jour. Forestry 17: 965–979. 1919.—Relationships existing between fire and climate have long been recognized by foresters but not before studied intensively. The moisture content of the forest litter is a prime consideration as to both ignition and rate of spread of fire. Litter dries out exceedingly fast under summer conditions and when it contains 8 per cent or less moisture, burns readily. Over this amount fire will not spread. Litter moisture is affected by climatic conditions, being driest on south slopes and the most moist on north slopes and at high elevations. Litter behaves like soil as regards hydroscopic moisture, taking up as much as 6 per cent of

its own weight.—The rate of spread of fires is best measured by perimeter rather than by area or distance, and is governed largely by wind velocity. This speed varies as the square of the wind velocity.—*E. N. Munns.*

233. Shull, C. A. **Curing timber.** [Rev. of: Stone, Herbert. **The ascent of the sap and the drying of timber.** Quart. Jour. Forest. 12: 261–266. 1918.] Bot. Gaz. 68: 310. 1919.—The author's suggestion may be sound on the practical side, but his "assumptions as to the movement of sap in trees will not meet with favor among plant physiologists. It is hard to imagine a conception more at variance with experimental results of physiological studies."

234. Sim, T. R. **South African rubber. I.** South African Jour. Indust. 2: 1127–1137. *5 pl.* 1919.

235. Sim, T. R. **South African rubber. II.** South African Jour. Indust. 3: 24–34. 1920.

236. Society of American Foresters, Committee for the Application of Forestry. **Forest devastation: a national danger and a plan to meet it.** Jour. Forest. 17: 911–945. 1919.—A detailed and comprehensive program of action is outlined. Blame is placed on the lumber industry and economic development for the state of affairs at present. To correct the evils which now exist, plans for constructive legislation are offered including the purchase and control of forest lands and production, the establishment of forest insurance agencies and forest loan banks, and state coöperation in securing tax and fire-prevention reforms. A minority report of the committee is also presented.—*E. N. Munns.*

237. Starte, H. W. **Reservation of standards in strips and checks in exploitation.** Indian Forester 45: 414–416. *1 fig.* 1919.—A system of parallel strips in cutting in coppice with standards has been worked out to prevent the tendency towards overcutting, and frauds by operators.—*E. N. Munns.*

238. Stevens, J. L. **Blackboy and its commercial uses.** Australian Forest Jour. 2: 201–202. 1919.—The outside portions of the blackboy or grass tree are reported to yield very fine drying oils and turpentine substitutes suitable for the manufacture of paints and varnishes. The acidic liquors obtained in the distillation process contain large quantities of acetic acid, methyl alcohol and tannin extract, while the gas is of high calorific value and purity, being free from sulphur and nitrogen compounds.—*C. F. Korstian.*

239. Taylor, A. A. **California's redwood park.** Amer. Forestry 25: 1446–1450. *4 fig.* 1919.

240. Tiemann, H. D. **Kiln-drying specifications for airplane lumber.** Sci. Amer. Supplem. 88: 104. *3 fig.* 1919.

241. Trägårdh, Ivar. **Några allmänna men hittills föga uppmärksammade barkborrar och deras gångsystem.** [Some common but hitherto little known bark beetles and their galleries.] Skogen 6: 237–246. *Pl. 1–7.* 1919.

242. Vernet, G. **Précautions à prendre dans l'enfumage du caoutchouc (Incendies-stickage).** [Precautions to be taken in smoking rubber.] Bull. Agric. Inst. Sci. Saigon 1: 362–364. 1919.

243. von Fankhauser, F. **Zur Kenntnis der Lärche.** [A larch study.] Schweiz. Zeitschr. Forstwesen 70: 188–194. *3 fig.* 1919.—The natural range of the species is taken as the area over which natural reproduction occurs, although good growth may be secured in other regions by artificial reproduction. Soil moisture is emphasized as the principal factor that limits the distribution of larch. Other writers have attributed depth and character of soil as important limiting factors, but the occurrence of larch on all types of soil and its distribution, limited only by elevation and exposure, are taken as conclusive evidence that soil texture

and depth are important only in so far as these qualities affect soil moisture. Variations of the root systems and the development of deep tap roots are influenced more by depth of water table than by character of soil. Transpiration is also an important factor. Dr. F. von Höhnel's experiments, which he conducted in 1879 with 21 species, showed that the amount of water transpired to produce 100 grams dry weight of leaves in various species was as follows: Larch, 115 L., Ash, 98 L., Beech, 86 L., Birch, 85 L., Spruce, 21 L., Pine, 10 L. The serviceberry was the only species that transpired more than the larch. Kirchner describes the anatomy of the larch needle as being especially adapted for aeration by the arrangement of the cells length-wise in the needles, and the cell walls joined only at the corners. Air spaces about the size of the cells occur between each two layers of cells. The thin cuticle of the needle is also a factor. Excessive transpiration indicates the necessity of an abundant supply of water. The shedding of leaves in the winter is a habit necessitated by the excessive transpiration. In periods of severe drought the needles turn yellow, and part of them may fall to conserve moisture. The tree, however, recovers readily and new leaves develop, whereas other conifers die. Specific cases were noted during the severe drought of 1911. The dense parabolic crowns formed on good moist soil and the open neiloid crowns formed on drier sites are so different that a division of species based on this character has been advocated. Competition of larch with other species is largely controlled by the supply of available water. The fir and the spruce spread their lateral roots near the surface and, to a large extent, prevent surface water from reaching the deeper soil in which the larch roots usually occur. Where the larch successfully competes with other species it is due to sub-irrigation of the area with water from other areas.—*J. V. Hofmann.*

244. von Kunz, I. **Zwanzigjährige forstliche Betätigung eines Laien. [Twenty years' forestry experience of a layman.]** Schweiz. Zeitschr. Forstwesen **70**: 195–200. 1919.—The author is a chemist whose interest in forestry prompted him to purchase a forest meadow of two hectares and plant it to tree seedlings. Spruce, fir, pine, larch, beech, oak, hornbeam and elm were used. The plantation was very successful, and at the age of twenty years the conifers formed a complete ground cover where they were spaced 1.25 m. by 1.25 m. The pines had begun to clear, but the spruce branches were still all green.—*J. V. Hofmann.*

245. von Seelen, D. **Der Wald als Bruder des Feldes. [The interdependence of forest and farm.]** Zeitschr. Forst- u. Jagdw. **51**: 308–315. 1919.—A plea for more thorough use of German forest resources. A policy is outlined to accomplish this end. The war, and its results, has made it necessary for Germany to adopt a broader policy of forest management. The former rather restrictive policy resulted in much waste of such natural resources as forage and nut crops within the forests, owing to the fact that grazing animals were apt to cause damage to reproduction. The author argues, however, that through proper regulation such damage can be minimized. Free use and administrative use policies are also outlined. Article, on whole, is an answer to an opponent to this broader concept of a forest policy.—*Hermann Krauch.*

246. Wahlgren, A. **Skogen och människan i förhistorisk tid. [The forest and man in prehistoric times.]** Skogen **6**: 1–8, 65–68, 229–236. 1919.

247. Walker, R. S. **The Paulownia tomentosa tree.** Amer. Forest. **25**: 1485–1486. *3 fig.* 1919.

248. Watt, A. S. **On the causes of failure of natural regeneration in British oakwoods.** Jour. Ecol. **7**: 173–203. 1919.

249. Weir, James E., and Ernest E. Hubert. **The influence of thinning on western hemlock and grand fir infected with Echinodontium tinctorium.** Jour. Forest. **17**: 21–35. 1919.—See Bot. Absts. 3, Entry 574.

250. Welo, L. A. Emergency seasoning of Sitka spruce. Sci. Amer. Supplem. 87: 404–405. *2 fig.* 1919.

251. Wood, B. R. Note on proposed system for regeneration of sal forests. Indian Forester 45: 403–413. 1919.—Changes in the management of sal forests are not believed essential and strip cutting is not feasible. Suggestions are made to study the growth and the relation of forest and fire to the regeneration of sal.—*E. N. Munns.*

252. Zimmer, Walter J. Regeneration of forests. Australian Forest. Jour. 2: 75–76. 1919.—A brief discussion of the suitability of the coppice method of regeneration to the eucalyptus forests of Australia, which sucker very freely.—*C. F. Korstian.*

GENETICS

George H. Shull, *Editor*

James P. Kelly, *Assistant Editor*

253. Abidin, J. Pferdezucht und Pferderassen im osmanischen Reich. [Horse breeding and horse breeds in the Osmanian country.] Flugschr. Deutsch. Ges. Züchtungsk. 1918: 31. *47 fig.* 1918.

254. Åkerman, Å. Växternas kölddöd och frosthärdighet. Föredrag vid Sveriges Utsädesforenings extra möte under Landtbruksveckan 1919. [Winter killing and frost-resistance of plants. A paper read at a special meeting of the Swedish Seed-Grain Association during the "Farmers Week," 1919.] Sveriges Utsädesförenings Tidskrift 29: 61–85. *4 fig.* 1919.—Detailed exposition of different theories to explain killing of plants by cooling. According to experiments of Lidfors and others on the importance of sugar in protecting plants against cold, it is supposable that hereditary differences in frost-resistance in different kinds of plants might possibly depend on hereditary differences in sugar content. Author also has been able to show that for wheat a parallelism seems to exist between sugar content and hardiness against cold, in such way that plants which are more resistant to frost contain more sugar than plants less resistant to frost.—In the following table four kinds of wheat are arranged in order of their resistance against cold, beginning with the least resistant:

VARIETY	DRY SUBSTANCE IN PER CENT OF FRESH WEIGHT	SUGAR IN PER CENT OF FRESH WEIGHT
Smaavete II	23.2	13.3
Solvete	23.8	14.8
Thulevete	24.7	17.1
Lantvete	26.0	19.6

The quantity of sugar varies much during different periods; but the sugar-curves are rather nearly parallel for the different sorts of wheat.—*K. V. Ossian Dahlgren.*

255. Allendorf and Ehrenberg. Die Aufgaben des Sonderausschusses für Zuckerrübenbau. [Special problems of sugar-beet breeding.] Mitt. Deutsch. Landw. Ges. 1919: 531–534. 1919.—See Bot. Absts. 5, Entry 259.

256. Amend F. Untersuchungen über flämischen Roggen unter besonderer Berücksichtigung des veredelten flämischen Landroggens und seiner Züchtung. [Investigations on Flemish rye with special reference to improved varieties and their breeding.] Landw. Jahrbüch. 52: 614–669. 1919.—See Bot. Absts. 5, Entry 260.

257. Anonymous. **The improvement of agricultural crops by selection and hybridization.** Scot. Jour. Agric. 2: 10–20. 1919.—Substance of address delivered to Glasgow and West Scotland Agricultural Discussion Society by T. Anderson, Director of the Board's Seed Testing Station. Mass selection, pure line selection, hybridization, and Mendelism in relation to crop improvement are discussed. Emphasis is placed on value of pure seed stocks to the farmer.—*R. J. Garber.*

258. Anonymous. **Report of the work of the plant breeding division for 1919.** Jour. Dept. Agric. Ireland 20: 102–107. 1920.

259. Anonymous. [German rev. of: Allendorf and Ehrenberg. **Die Aufgaben des Sonderausschusses für Zuckerrübenbau.** (Special problems of sugar-beet breeding.) Mitt. Deutsch. Landw. Ges. 1919: 531–534. 1919.] Zeitschr. Pflanzenzücht. 7: 112. Dec., 1919.

260. Anonymous. [German rev. of: Amend, F. **Untersuchungen über flämischen Roggen unter besonderer Berücksichtigung des veredelten flämischen Landroggens und seiner Züchtung.** (Investigations on Flemish rye with special reference to improved varieties and their breeding.) Landw. Jahrbüch. 52: 614–669. 1919.] Zeitschr. Pflanzenzücht. 7: 112. Dec., 1919.

261. Anonymous. [German rev. of: Barker, E. **Heredity studies in the morning-glory (Ipomoea purpurea).** New York Cornell Agric. Exp. Sta. Bull. 392. *39 p., 3 pl.* 1917. (See Bot. Absts. 1, Entry 1164.)] Zeitschr. Pflanzenzücht. 7: 113. Dec., 1919.

262. Anonymous. [German rev. of: Baur, Erwin. **Über Selbststerilität und über Kreuzungsversuche einer selbstfertilen und einer selbststerilen Art in der Gattung Antirrhinum.** (On self-sterility and crossing experiments with a self-fertile and self-sterile species in the genus Antirrhinum.] Zeitschr. indukt. Abstamm. Vererb. 21: 48–52. May, 1919. (See Bot. Absts. 3, Entry 2082.)] Zeitschr. Pflanzenzücht. 7: 114. Dec., 1919.

263. Anonymous. [German rev. of: Becking, L. G. M. Baas. **Over Limietverhoudingen in Mendelsche populaties.** (Limiting proportions in Mendelian populations.) Genetica 1: 443–456. *4 fig.* Sept. 1919. (See Bot. Absts. 3, Entry 2086.)] Zeitschr. Pflanzenzücht. 7: 113. Dec., 1919.

264. Anonymous. [German rev. of: Emerson, R. A. **A fifth pair of factors, Aa, for aleurone color in maize, and its relation to the Cc and Rr pairs.** Cornell Univ. Agric. Exp. Sta. Mem. 16: 231-289. *Fig. 71.* Nov., 1918. (See Bot. Absts. 1, Entry 877.)] Zeitschr. Pflanzenzücht. 7: 115. Dec., 1919.

265. Anonymous. [German rev. of: Fraser, Allan Cameron. **The inheritance of the weak awn in certain Avena crosses and its relation to other characters of the oat grain.** Cornell Univ. Agric. Exp. Sta. Mem. 23: 635–676. June, 1919.] Zeitschr. Pflanzenzücht. 7: 116–117. Dec., 1919.—See also Bot. Absts. 5, Entry 292.

266. Anonymous. [German rev. of: Freeman, G. F. **Linked quantitative characters in wheat crosses.** Amer. Nat. 51: 683–689. 1917.] Zeitschr. Pflanzenzücht. 7: 116. Dec., 1919.

267. Anonymous. [German rev. of: Frölich, G. **Die Umzüchtung von Wintergetreide in Sommergetreide.** (The breeding of winter cereals into spring cereals.) Friedrichswerther Monatsber. 9: 27–30. 1919.] Zeitschr. Pflanzenzücht. 7: 118. Dec., 1919.—See also Bot. Absts. 5, Entry 284.

268. Anonymous. [German rev. of: Frölich, G. **Die Beeinflussung der Kornschwere durch Auslese bei der Züchtung der Ackerbohne.** (The influencing of grain-weight by selection in the breeding of field beans.) Friedrichswerther Monatsber. 9: 7–8, 17–20. 1919.] Zeitschr. Pflanzenzücht. 7: 117–118. Dec., 1919.

269. Anonymous. [German rev. of: Fruwirth, C. **Die gegenwärtige Organisation der Pflanzenzüchtung in Deutschland und in Österreich-Ungarn.** (The present organization of plant breeding in Germany and Austria.) Nachricht. Deutsch. Landw. Ges. Österreich. 1919: 35–39. 1919.] Zeitschr. Pflanzenzücht. 7: 118. Dec., 1919.

270. Anonymous. [German rev. of: Fruwirth, C., Dr. Th. Roemer, Dr. E. von Tschermak. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe.** (Handbook of agricultural plant breeding. 4. Breeding of the four chief cereals and the sugar beet). *8vo., xv+504 p., 42 fig.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 7: 145. Dec., 1919.

271. Anonymous. [German rev. of: Gassner, S. **Beiträge zur physiologischen Charakteristik sommer- und winteranueller Gewächse, insbesondere der Getreidepflanzen.** (Contribution to the physiological characteristics of summer and winter annuals with special reference to the cereals.) Zeitschr. Bot. 10: 417–480. *7 pl., 2 fig.* 1918.] Zeitschr. Pflanzenzücht. 7: 118–120. Dec., 1919.

272. Anonymous. [German rev. of: Hansen, W. **Einiges über Rübenzucht.** (Something about beet-breeding.) Landw. Zeitung 1919.] Zeitschr. Pflanzenzücht. 7: 120. Dec., 1919.

273. Anonymous. [German rev. of: Jones, D. F. **Natural cross-pollination in the tomato.** Science **43**: 509–510. 1916.] Zeitschr. Pflanzenzücht. 7: 120. Dec., 1919.

274. Anonymous. [German rev. of: Jones, D. F. **Linkage in Lycopersicum.** Amer. Nat. 51: 608–621. 1917.] Zeitschr. Pflanzenzücht. 7: 120–121. Dec., 1919.

275. Anonymous. [German rev. of: Jones, D. F. **Dominance of linked factors as a means of accounting for heterosis.** Genetics 2: 466–479. *1 fig.* 1917. See Bot. Absts. 1, Entry 1245.] Zeitschr. Pflanzenzücht. 7: 121. Dec., 1919.

276. Anonymous. [German rev. of: Jones, D. F. **The effect of inbreeding and cross-breeding upon development.** Connecticut Agric. Exp. Sta. Bull. 207. *100 p., 12 pl.* New Haven, 1918. (See Bot. Absts. 2, Entry 34; 3, Entry 988.)] Zeitschr. Pflanzenzücht. 7: 122. Dec., 1919.

277. Anonymous. [German rev. of: Jones, Donald F. **Bearing of heterosis upon double fertilization.** Bot. Gaz. 65: 324–333. April, 1918. (See Bot. Absts. 1, Entry 228.)] Zeitschr. Pflanzenzücht. 7: 121–122. Dec., 1919.

278. Anonymous. [German rev. of: Kajanus, Birger. **Genetische Papaver-Notizen.** (Genetical notes on Papaver.) Bot. Notiser 1919: 99–102. 1919. (See Bot. Absts. 3, Entry 2145.)] Zeitschr. Pflanzenzücht. 7: 123. Dec., 1919.

279. Anonymous. [German rev. of: Kajanus, B. **Genetische Studien über die Blüten von Papaver somniferum L.** (Genetical studies on the flowers of Papaver somniferum L.) Arkiv Bot. K. Svensk. Vetenskapsakad. 15: 1 87. *3 pl.* 1919. (See Bot. Absts. 3, Entry 2147.)] Zeitschr. Pflanzenzücht. 7: 123–125. Dec., 1919.

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312. Anonymous. [German rev. of: Urban, J. **Hochpolarisierende Rübe und ihre Nachkommenschaft. (High-polarizing beets and their progeny.)** Zeitschr. Zuckerindustr. Böhmen **42:** 387–391. 1919.] Zeitschr. Pflanzenzücht. **7:** 141–142. Dec., 1919.

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314. Anonymous. [German rev. of: von Caron-Eldingen. **Physiologische Spaltungen ohne Mendelismus. (Physiological segregation without Mendelism.)** Deutsch. Landw. Presse **1919:** 515–516. 1919.] Zeitschr. Pflanzenzücht. **7:** 114–115. Dec., 1919.

315. Anonymous. [German rev. of: von Ubisch, G. **Gerstenkreuzungen. (Barley crosses.)** Landw. Jahrb. **53:** 191–244. *3 pl., 23 fig.* 1919.] Zeitschr. Pflanzenzücht. **7:** 141. Dec., 1919.

316. Anonymous. **Flugblatt der Ungarischen Gesellschaft für Rassenhygiene und Bevölkerungspolitik. [Circular of the Hungarian Society for race hygiene and colonization policy.]** Münchener Med. Wochenschr. **66:** 76–77. 1919.

317. Anstead, R. D. **Improvement of coffee by seed selection and hybridization.** Agric. Jour. India **14:** 639–644. 1919.—An address at the Coffee Planters' Conference at Mysore, India, July 1918. It is urged that the growers select high-yielding coffee trees for propagation in the belief that the present practice of raising nursery stock from "plantation run" seed is resulting in the deterioration of the varieties. It is suggested that facilities be provided to economic botanists for developing new varieties by hybridization. Author also reports that a Mr. Jackson has obtained a vigorous and disease-resistant hybrid which comes true from seed. [See Bot. Absts. 4, Entry 893.]—*J. H. Kempton.*

318. Arthur, J. M. [Rev. of: Folsom, Donald. The influence of certain environmental conditions, especially water supply, upon form and structure in Ranunculus. Physiol. Res. 2: 209–276. *24 fig.* Dec., 1918. (See Bot. Absts. 1, Entry 1484; 2, Entry 307.)] Bot. Gaz. 69: 271. Mar., 1920.

319. Bach, Siegfried. Noch ein Bastardierungsversuch Pisum X Faba. [Another hybridization experiment, Pisum × Faba.) Zeitschr. Pflanzenzücht. 7: 73–74. June 1919.—Of ten emasculated flowers of Victoria peas, seven were pollinated with *Vicia faba* pollen, while three were left unpollinated. All ten were bagged. After 48 hours, 3 of the pollinated flowers were fixed in Flemming's solution and imbedded in paraffin. Later sections stained with Heidenhain's haematoxylin showed only a few very short pollen-tubes and these in no case were observed penetrating the stigmatic surface. After 8 days, the remaining seven bagged flowers, both pollinated and unpollinated, were found to have developed to the same degree, small pods 1–2 cm. long 0.4 to 0.6 cm. wide with shriveled seed-"anlagen," and within another 10 days, these dried up and fell off. Results confirm Gärtner and von Tschermak. Seedless pods are parthenocarpic and formed without pollination. Inability of *Vicia faba* and *Pisum* to hybridize lies in lack of chemical stimuli to promote pollen-tube growth.—*Orland E. White.*

320. Bach, Siegfried. Zur näheren Kenntnis der Faktoren der Anthozyanbildung bei Pisum. (To a more exact knowledge of the factors for the formation of anthocyan in Pisum.] Zeitschr. Pflanzenzücht. 7: 64–65. June 1919.—Red F_1 heterozygote Pisum flowers from red-flowered × white-flowered (*ABaB*) and pink-flowered × white-flowered (*AbaB*) crosses are indistinguishable to the eye from those of the red-flowered homozygote (*ABAB*). Investigations of the concentration and other characteristics of anthocyan, demonstrated that anthocyan development, both qualitatively and quantitatively, is the same in all these genetic types. Comparisons of pink-flowered homozygous types (*AbAb*) with the above red-flowered types shows an anthocyan concentration difference of 2:1 in favor of the latter. Milton Bradley color scale showed color extracts from red-flowered types to be similar to "Violet red," and pink-flowered extracts to be "Violet red tint no. 1." Concludes that red-flower coloring matter differs from that of pink in having greater anthocyan concentration and in being a distinct kind of anthocyan. Factor *A* is more important in furnishing a basis for anthocyan formation than factor *B*, the latter acting as a modifying agent which changes the anthocyan of pink-flowers to that of a new type (red) with more violet in it. Names of pea varieties used are cited and methods of procedure are given in detail.—*Orland E. White.*

321. Bateson, W. Dr. Kammerer's testimony to the inheritance of acquired characters. Nature 103: 344–345. July 3, 1919.—Reply to Prof. MacBride (Nature, May 22), describing personal experiences which cast serious doubt upon veracity of Kammerer's claims of inheritance of acquired characters in salamanders.—*Merle C. Coulter.*

322. Baudouin, M. Découverte d'un procède sûr pour reconnaitre le sexe des axis humains â tout âge. [Discovery of a process for the recognition of sex in the human axis at all ages.] Compt. Rend. Acad. Sci. Paris 167: 652–663. 1918.

323. Baumann, E. Zur Frage der Individual- und der Immunitätszüchtung bei der Kartoffel. [On individual selection and breeding for immunity in potatoes.] Fühlings Landw. Zeitg. 1918: 246. 1918.

324. Baumann, E. Beiträge zur Kenntnis der Rapspflanze und zur Züchtung des Rapses. [Contribution to a knowledge of the rape plant, and to the breeding of the rape.] Zeitschr. Pflanzenzücht. 6: 139. *2 fig.* 1918.

325. Becker, J. Vererbung gewisser Blütenmerkmale bei Papaver Rhoeas. [Inheritance of certain floral characters in Papaver Rhoeas.] Zeitschr. Pflanzenzücht. 6: 215–221. *3 fig.* 1918.

326. Becker, J. **Beiträge zur Züchtung der Kohlgewächse.** [Contribution to the breeding of the Brassicas.] Zeitschr. Pflanzenzücht. 7: 91–99. Dec., 1919.

327. Bergh, Ebbe. **Studier över dövstumheten i Malmöhus län.** [Studies on deaf-dumbness in the district of Malmöhus, Sweden.] *185 × 250 mm., 199 p.* Stockholm, 1919.—Among deaf-and-dumbs there are a greater number of individuals with brown or black hair and brown eyes than among normal persons in Sweden. The author considers that this fact is caused by descent from immigrant darker types. He points out that there is scarcely any chance to restrain the consanguineal deaf-dumbness by legal directions.—*K. V. Ossian Dahlgren.*

328. Biggar, H. H. **The relation of certain ear characters to yield in corn.** Jour. Amer. Soc. Agron. 11: 230–234. 1919.—Relationship of four ear characters to yield has been measured for five varieties of maize. The ear characters chosen were weight, length, numbers of rows and shelling percentage. Data were obtained for a period of several years. It was found that ear length was the most consistent index of subsequent yield though the highest correlation coefficient found in the series was between weight and yield. The author concludes that these four ear characters are not closely enough associated with yield to be of value as a basis for selection.—*J. H. Kempton.*

329. Bixby, W. G. **The butternut and the Japan walnut.** Amer. Nut Jour. 10: 76–79. 82, 83, *11 fig.* 1919.—Occurrence of rough-shelled walnuts on American-grown trees of the two Japanese species, *Juglans cordiformis* and *J. Sieboldiana,* is discussed, illustrated and convincingly explained as due to natural hybridization between the above species and the closely related native American species *J. cinerea.* Reference is also made to the possibility of producing new superior hybrid varieties between these oriental and American species which can be grown throughout a greater range of latitude than these walnuts at present occupy. —*E. B. Babcock.*

330. Blakeslee, Albert F. **Sexuality in mucors.** Science 51: 375–382, 403–409. *4 fig.* April 16 and 23, 1920.—Mucors are divided into two groups as regards sexual reproduction: (1) homothallic or hermaphroditic forms, and (2) heterothallic or dioecious forms. The latter are by far the most abundant in nature.—Sexes of different dioecious species show an imperfect sexual reaction and produce gametes which, however, never fuse. By this "imperfect hybridization" reaction the sex of unmated dioecious races may be determined. In dioecious species there are two types of zygospore germination. In one case the spores in a germsporangium are all of same sex, but in the other the spores are of both sexes. Environmental factors have a direct influence on zygospore formation. Many "neutral" races have been found which give no sexual reaction *inter se* or with testers of other species. The apparent neutrality of such races may be due to lack of the peculiar environmental conditions necessary for expression of the sex which is actually present. All dioecious species investigated are sexually dimorphic. Author discusses gamete differentiation in mucors and its possible significance in relation to sex differentiation in higher forms.—*W. H. Eyster.*

331. Bliss, A. J. **Hybrid bearded Irises.** Gard. Chron. 67: 76, 88. Feb. 14, 21, 1920.—Older varieties of June-flowering bearded Irises may be referred to two main species, *pallida* and *variegata,* or combinations of the two. *Amoena* is a color variety of *variegata,* due to inhibiting factor for yellow or absence of factors for yellow present in *variegata. Neglecta* is *squalens* minus yellow. Several hundred crossings of *plicata* color type do not yield conclusive evidence of origin. Characteristic beard is carried through generations of transition seedlings in which it has disappeared along with *plicata* color characters, reappearing unaltered in succeeding individuals of plicata color type. *Plicata* crossed with *pallida* or *squalens-pallida* forms give *plicata* only. Crossed with *pallida* or *variegata* the *plicata* type disappears but when crossed with certain *neglectas* or *squalens*-carrying *plicata* the Mendelian ratio of one-half *plicatas* is obtained, suggesting that the *plicata* type has arisen as a mutation from

pallida by the dropping of a single factor or set of linked factors. Standards and falls of an *Iris* appear to be controlled, both in form and in color, by independent sets of linked factors. —*J. Marion Shull.*

332. Bornmüller, J. Notizen zur Flora Unterfrankens nebst einigen Bemerkungen über Bastarde und eine neue Form von Polystichum lonchitis (L) Roth im Alpengebiet. [Observations on the flora of Unterfranken, with several remarks on hybrids and a new form of Polystichum lonchitis (L) Roth in the alpine region. Beih. Biol. Centralbl. 36: 183-199. *1 pl.* 1918.—See Bot. Absts. 4, Entry 1704.

333. Boulenger, G. A. Un cas intéressant de dimorphisme sexuel chez un serpent africain (Bothrolychus ater Günther). [An interesting case of sexual dimorphism in an African snake.] Compt. Rend. Acad. Sci. Paris 168: 666-669. 1919.—See Bot. Absts. 5, Entry 1463.

334. Brandl, J. Die direkte Anpassung und Vererbung der Pflanzen. [Direct adaptation and heredity in plants.] Wiener Landw. Zeit. 68: 790. 1918.

335. Brehm, V. Über geschlechtsbegrenzte Speziesmerkmale der Süsswasserorganismen und deren eventuelle experimentelle Aufklärung durch das Mendelsche Spaltungsgesetz. [On the sex-limited species-characters of freshwater organisms and their experimental explanation through the Mendelian law of segregation.] Naturw. Wochenschr. 18: 4-8. 1919.

336. Bridges, C. B., and T. H. Morgan. Contributions to the genetics of Drosophila melanogaster. II. The second chromosome group of mutant characters. Carnegie Inst. Washington Publ. 278. *P. 123-204, 7 pl., 17 fig.* Washington, D. C. 1919.—39 mutant races with genes in "second chromosome" are described, paralleling treatment of sex-linked characters in Carnegie Publ. 237; more than 35 others, discovered since 1916, remain to be described. Most important genes, with loci, are:

0.0 Star	(*S*)	affects mainly eye-facets
15.4 Streak	(*k*)	affects mainly thorax pattern
29.0 Dachs	(*d*)	affects mainly venation and legs
46.5 Black	(*b*)	affects mainly body color
52.7 Purple	(*pr*)	affects mainly eye color
65.0 Vestigial	(*vg*)	affects mainly wings and halteres
73.5 Curved	(*c*)	affects mainly wing curvature
96.2 Plexus	(*px*)	affects mainly wing venation
105.1 Speck	(*sp*)	affects mainly axil of wing

Mutants are treated in chronological order of discovery; special attention is given to genetic methods employed, and tracing their development. Each mutant is fully described as to origin, stock, determination of chromosome and locus, reoccurrences, allelomorphs, modifiers, literature, and value as a genetic tool. General topics, discussed under mutants to which they apply, include: modifying factors, autosomal and balanced lethals, variations in crossing-over due to age, temperature, and specific genes, causes of inviability and methods of "balancing" inviability in experiments, coincidence and its bearing on map-distance, linkage method of analysis for multiple-gene cases, etc.—Most of the mutants are recessive, i.e., the heterozygote can not be distinguished from normal. Only five are dominant; at least four of these are lethal when homozygous, like most dominant mutations in *Drosophila*. Some (e.g., black, blistered, etc.) are partially dominant; i.e., the heterozygote is intermediate between homozygote and normal, but usually more like normal. Two of the genes (lethal T and lethal IIa) show their presence only by disturbance of expected ratios, since they have no visible effect when heterozygous, and kill all flies homozygous for them. Certain genes are "specific modifiers," i.e., they produce no effect except in the presence of certain other "main" genes; thus cream II, cream b, and pinkish, all dilute eosin (sex-linked) eye color but produce no visible effect on non-eosin flies; again, one or more second-chromosome genes reduce bristle number in dichaete (third chromosome), but not in non-dichaete, flies. Pur-

ple is a "disproportionate modifier" of vermilion, i.e., it modifies vermilion (sex-linked) more than it does normal eye color.—One series of multiple (quintuple) allelomorphs is described; vestigial, strap, antlered, nick, all affecting wings.—The method of construction of map of second chromosome is described in detail. The "second chromosome" was originally defined arbitrarily as "that chromosome which carries the gene for black and such other genes as may be found to be linked to black." Loci lying on the same side of black as does curved were considered "to the right" or in plus direction from black; those on the opposite side "to the left" or in minus direction. First distance mapped, black-purple, based on 48,931 flies, is 6.2 units (6.2 per cent crossing over), a distance small enough to exclude double crossing over. Other loci located by combining data from different crosses, corrected, where necessary, for double crossing-over, and weighted according to numbers and probable accuracy. Thus vestigial was located 18.5 units to right of black, curved 27.0. These four loci form central framework of chromosome. Dachs was next located at −17.5 (with reference to black) streak at −31.1, star at −46.5. Most important locus at right end is speck, at +58.6 from black. All other loci are located with reference to one or more of the foregoing. As star is of known loci, farthest to left, it is taken as zero point, and other loci renumbered accordingly. Present map of second chromosome, made in this way, with location of all genes treated, is given in text; also constructional map, showing method of construction.—Working map, subject to continuous changes, shows also value of each mutant. Value depends on constancy of character, separability from normal, viability, fertility, accuracy of mapping, and location at convenient distance from other important loci.—*C. R. Plunkett.*

337. Burt, B. C., and N. Haider. **Cawnpore-American cotton: An account of experiments in its improvement by pure-line selection and of field trials, 1913–1917.** Agric. Res. Inst. Pusa Bull. **88.** *32 p., 10 pl., 1 fig.* 1919.

338. Carle E. **Sélection pédigrée appliquée a la variété local de riz Phung-tien. [Pedigree selection applied to the local rice variety known as Phung-tien.]** Bull. Agric. Inst. Sci. Saigon **2:** 26–32. 1920.

339. Cohen-Stuart, C. P. **Erfelijkheidsleer in dienst der bestrijding van dierlijke vijanden. [Genetics and the production of animal foods.]** Teysmannia 1918: 37–48. 1918.

340. Coppola, Alfredo. **L'acrocefalosindattilia. Contributo allo studio delle disendocrinie congenite. [Acrocephalosyndactylism. A contribution to the study of congenital disendocriny.]** Revista di Patol. Nerv. e. Ment. **24:** 283–339. *19 fig.* Dec. 1919.

341. Correns, C. **Fortsetzung der Versuche zur experimentellen Verschiebung des Geschlechtsverhältnisses. [Continuation of the attempt to experimentally shift the sex ratio.]** Sitzungsber. Preuss. Akad. Wiss. Berlin **1918:** 1175–1200. *3 fig.* 1918.

342. Crozier, W. J. **Sex-correlated coloration in Chiton tuberculatus.** Amer. Nat. **54:** 84–88. Jan.–Feb., 1920.—Foot, ctenidia and other soft parts of male are pale buff color. Corresponding parts in female are salmon-pink to orange-red, depending principally on state of maturity of ovary. Pigment belongs to carotin-like "lipochromes." Evidence shows that color difference cannot possibly help in sex recognition and must therefore be looked upon as a "metabolic accident."—*H. L. Ibsen.*

343. Dahlgren, K. V. Ossian. **Heterostylie innerhalb der Gattung Plumbago. [On the occurrence of heterostyly in the genus Plumbago.]** Svensk Bot. Tidskr. **12:** 362–372. *8 fig.* 1918.—*Plumbago capensis* Thunb., *P. rosea* L. and *P. europaea* L. are heterostylous plants. The anthers in long-styled flowers are not placed so deeply in the tube as the stigma in brevistylous ones. Stigmas of the two types are very different both in size and form. The difference between the pollens of the two sorts of plants is however relatively slight. Among forty investigated herbarium specimens of *Plumbago europaea* 18 were short-styled and 22 long-styled, which indicates that the two types may exist in about equal numbers. Heterostyly seems to exist also in the genera *Ceratostigma* and *Vogelia.*—*K. V. Ossian Dahlgren.*

344. Danforth, C. H. **An hereditary complex in the domestic fowl.** Genetics 4: 587–596. *5 fig.* Nov., 1919.—Brachydactyly, syndactyly, and ptilopody (booting) are believed by the author to be the somatic expression of a single gene and data in support of this view are presented.—*H. D. Goodale.*

345. Davenport, C. B. **Influence of the male in the production of human twins.** Amer. Nat. 54: 122–129. Mar.–Apr., 1920.—Both the fathers and the mothers of twins are found to come from fraternities in which twins are about four times as frequent as in the population at large. If only the data involving uniovular twins be considered, the frequency of twins in the parental generation is twelve times that of the population at large, and is as high on the father's side as on the mother's. Uniovular twinning is directly hereditary through either parent as in the armadillo. It is tentatively suggested that biovular twinning is indicative of marked reproductive vigor and relative absence of lethal factors on both sides. Since data from comparative sources show that only a fraction of the eggs ovulated become fertilized and reach late embryonic stages, and since there is good evidence that a high percentage of originally twin pregnancies result in only a single viable foetus, the assumption seems justified that two-egg ovulations are relatively common in man, but that only a small part of such ovulations actually result in twins that are born and recorded as such.—*C. H. Danforth.*

346. Dawson, Andrew Ignatius. **Bacterial variations induced by changes in the composition of culture media.** Jour. Bact. 4: 133–148. Mar., 1919.—As test organism author used a long-cultivated strain of *Bacterium coli.* Preliminary test showed that maximum growth of this organism on meat extract agar was attained in 9 to 11 days. In order to determine effect on this organism of change in environment, so far as regards media, chemical analysis was made of 9-days growth collected from 8 different media. These media consisted of 2 per cent agar to which was added various combinations of peptone, meat extract, edestin, flour proteins, butter soap, glucose and glycerol. Varying proportions of these substances were used, and in most cases no more than two appeared in each medium in addition to the agar. One medium consisted of potato juice alone. Considerable variability occurred in the proportions of nearly all bacterial constituents as the result of growth on these different media.—Production of acid and gas in various carbohydrates was tested in litmus-carbohydrate-serum water after about 200 generations growth on each of the 8 different media. Marked variability occurred; on one medium the organism behaved precisely as a *B. coli-communior*, while on two others it possessed almost the type characteristics of a *B. coli-communis.*—Agglutinability of organisms grown on all 8 media were tested with sera obtained by injection into rabbits of bacteria grown on 4 of the media. Differences in agglutinability were observed easily as great as those frequently utilized to demonstrate the existence of different "strains" of the same basic organism.—Morphological changes accompanying growth on different media appeared to be relatively unimportant. [See Bot. Absts. 3, Entry 1237.]—*M. A. Barber.*

347. Dawson, J. A. **An experimental study of an amicronucleate Oxytricha. I. Study of the normal animal, with an account of cannibalism.** Jour. Exp. Zool. 29: 473–513. *2 pl., 3 fig.* Nov. 20, 1919.—Pedigreed cultures of *Oxytricha hymenostoma* carried 289 generations, then from November 17, 1917, to April 30, 1918, in small petri-dish mass cultures, revealed the absence of micronucleus during all phases of life-history of cultures. This amicronucleate race apparently can live indefinitely under favorable environmental conditions without conjugation, autogamy, endomixis. In state resembling syngamy (*a*) animals fused in pairs die or separate and reproduce with no signs of depression. (*b*) cannibalism occurs causing increased fission rate among progeny of cannibal for short time. [See also next following Entry, 348.]—*Austin R. Middleton.*

348. Dawson, J. A. **An experimental study of an amicronucleate Oxytricha. II. The formation of double animals or 'twins.'** Jour. Exp. Zool. 30: 129–157. *1 pl., 13 fig.* Jan 5, 1920.—Under conditions similar to those in which syngamy usually occurs is strong tendency for formation of double animals, "twins," by plastogamic dorsal fusion. Twins have all

morphological structures of two single animals, reproduce by transverse fission. Favorable environmental conditions necessary for continued existence of twins, i.e., do not survive in competition with single animals. Selection produced striking increase in percentage of twins in pedigreed culture from single twin animal. Division rate of twins similar to that of normal animals. Miscible condition of twin cytoplasm handed on to twin progeny but is quickly lost in single animals derived from twins, kept under identical environmental conditions. Under favorable environmental conditions twin strains breed indefinitely. Pairing, cannibalism, twin formation, occur among animals in similar physiological condition, these phenomena therefore interpreted as abortive attempts to undergo syngamy, failure due to amicronucleate condition. Inability to undergo syngamy has no effect on viability of race. [See also next preceding Entry, 347.]—*Austin R. Middleton.*

349. De Vries, H. **Phylogenetische und gruppenweise Artbildung. [Phylogenetic and group-wise species-formation.]** Flora 11–12 (Festschr. E. Stahl): 208–226. 1918.—Under the term "gruppenweise Artbildung" de Vries understands the formation of a species within a genus. There are also frequent transitions such as the reappearance of the same mutation within a species. For example, the occasional appearance of a peloric form of *Linaria vulgaris*. For the study of "group-wise" species formation the genus *Oenothera* offers excellent material. The mutations observed in this genus can be divided into general and special. The general mutations can be considered as parallel and taxonomic from the standpoint of the systematist, and as progressive and retrogressive from the standpoint of the geneticist. The parallel mutations appear in different species, as for example, the dwarfs which are produced every year by *Oe. biennis* and *Oe. Lamarckiana*, and the *sulfurea* form of *Oe. biennis* and *Oe. suaveolens*. Parallelism is not limited to species of one genus but goes beyond these limitations. For example, the cruciate form of sepals of *Epilobium hirsutum cruciatum*, and very rare mutations of *Oe. biennis cruciata*. As an example of taxonomic mutation de Vries cites the complete lack of petals in the mutant *Oe. suaveolens*.—The absence of petals is a species character of *Fuchsia macrantha* and *F. procumbens*. Examples of progressive mutations are those in which a double number of chromosomes occurs,—*gigas* forms. Among retrogressive mutations are *Oe. nanella*, *Oe. brevistylis* and *Oe. rubrinervis*. The half-mutants are those which are produced by the fusion of a recessive mutated gamete with a normal gamete, as the mutant *gigas*. In this form we have annually 2 to 3 per cent mutants of the dwarf form. The half-mutants, which can be isolated here, give 25 per cent plants of the *gigas* form, 50 per cent half-mutants and 25 per cent dwarfs. The first and third forms are constant. The half-mutants lead us to the group of special mutations. The first example cited by author is *Oe. grandiflora*. Two-thirds of the plants grown from seed are green and like the parent, and one-third consists of yellow-green weak forms which die if left in the open. About one-fourth of the seed are sterile. This phenomenon author explains in the following manner: *Oe. grandiflora* is a half-mutant which segregates into 25 per cent *ochracea* forms, 50 per cent half-mutant forms, and 25 per cent homozygous forms, the latter of which cannot be formed because the factor for *grandiflora* is united with a lethal factor. Parallel with this is also the appearance of *Oe. Lamarckiana* mut. *rubrinervis*, which segregates in *Oe. deserens* and *Oe. rubrinervis*. About half of the seeds of *Oe. Lamarckiana* are empty. This is explained by author in that *Oe. Lamarckiana* produces two kinds of gametes, the typical or *laeta*, and the *velutina*. Each gamete has a lethal factor which is closely linked with the character factor. Heterozygous combinations of these factors give good seeds which produce plants and homozygotic combinations give the sterile seeds. If one of the two lethal factors becomes "vital" the *laeta* or the *velutina* mutation appears. Finally he considers heterogamy, i.e., the phenomenon in which the direct and the reciprocal crosses are not the same. He assumes that the species which are crossed are half-mutations but that part of the pollen is lethal.—*M. Demerec.*

350. De Wilde, P. A. **Verwantschap en Erfelijkheid bij doofstomheid en retinitis pigmentosa. [Relationship and heredity in deaf-and-dumbness and retinitis pigmentosa.]** Dissertation, Amsterdam. 1919.—See also Bot. Absts. 4, Entry 520.

351. De Winiwarter, H. Les mitoses de l'épithélium séminal du chat. [Mitoses of the seminal epithelium of the cat.] Arch. Biol. 30: 1–87. *1 double pl. with 34 fig.* 1919.—Thirty-six chromosomes occur in oögonial cells, thirty-five in spermatogonial, the difference depending on the heterochromosomes. The thirty-four autosomes unite to form seventeen bivalents in the primary spermatocyte, the heterochromosome constituting an eighteenth element. Secondary spermatocytes have eighteen and seventeen chromosomes respectively, and these numbers are maintained in the spermatids and consequently in the spermatozoa, since the last division is an equation-division. The heterochromosome is not detectable in the spermatogonia but appears gradually in the telophase of the last spermatogonial division. It finally becomes visible as an elongated body, often curved or even sharply bent. It never appears double as does its homologue in the oöcyte. It is readily distinguished from the nucleolus, which is spherical and visible in spermatogonia as well as in the spermatocytes.—Author believes that his earlier counts in oögenesis, in which he and Saintmont recorded twelve chromosomes on the first maturation spindle and estimated twenty-four as the somatic number, were incorrect. He now thinks that the division figures were abnormal or that in fixation the chromosomes agglutinated.—Various authors have described a "monosome" in the germ-cells of the female cat but author is convinced that what they have regarded as a single body is the two heterochromosomes in juxtaposition.—The observational part of the paper is followed by twenty-six pages of discussion of the literature and of general aspects of the work.—*M. F. Guyer.*

352. Doblas, José Herrera. Seleccion de semillas. [Seed selection.] Bol. Assoc. Agric. España 11: 90–95. 1919.

353. Dodge, Raynal. Aspidium cristatum × marginale and A. simulatum. Amer. Fern Jour. 9: 73–80. 1919.—Extracts from letter written to C. H. Knowlton by Dodge in 1907 containing a detailed account of his discovery of the Massachusetts fern and the hybrid between the crested and marginal ferns.—*F. C. Anderson.*

354. Dresel, Kurt. Inweifern gelten die Mendelschen Vererbungsgesetze in der menschlichen Pathologie? [To what extent do Mendelian laws of heredity hold in human pathology?] Virchow's Arch. 224: 256–303. 1917.—In general, the so-called laws of heredity (e.g., the "law of filial regression") are not such in the strictest sense, but the Mendelian law does present a conception which is fundamental to the study of human heredity. Hereditary disease may be due to single dominant or recessive factors or to combinations of factors. Occasional departures from expected results seeming to show incomplete dominance are due to the chance absence from the germplasm of a second factor which is usually present in homozygous form and which is essential to the actual manifestation of the condition. Sex-linked inheritance is wholly in accord with Mendel's law and is the expression of a certain degree of affinity between the sex factor ("gamete") and the disease-favoring factor. Since the proportion of affected individuals and female carriers is believed frequently to be high in sex-linked inheritance, the occasional presence of two equally potent but independent factors is suggested. The essay, which received the "Schulze Preis," is illustrated by forty-seven graphic diagrams and several tables classifying human diseases on the basis of their behavior in heredity. There is a rather extensive bibilography.—*C. H. Danforth.*

355. Dreyer, Th. F. A suggested mechanism for the inheritance of acquired characters. South African Jour. Sci. 14: 272–277. 1918.

356. Drude, O. Erfahrungen bei Kreuzungsversuchen mit Cucurbita Pepo. [Experiences in crossing experiments with Cucurbita Pepo.] Ber. Deutsch. Bot. Ges. 35: 26–57. *1 pl.* 1918.

357. Dunn, L. C. The sable varieties of mice. Amer. Nat. 54: 247–261. *3 fig.* May–June, 1920.—Sable is a form of yellow mouse showing considerable dark pigment on dorsal and lateral aspects. Black and tan is an extreme type of this variety. Darkness of sables

and black and tans appears due to genetic causes transferable to non-yellow varieties. Cross between agouti (light) and black and tan (dark) gives F_1 sables and agoutis both intermediate. Further hybrid generations showed many light segregates both yellow and non-yellow, and fewer dark segregates. No *extreme* dark segregates found in yellow (black and tan) types, and few extreme dark non-yellow segregates. These latter proved not homozygous for darkening factors. Results indicate presence of genetic factors similar to those producing differences in size of rabbits. This similarity indicates unsuitableness of material for production of clear and analyzable results, rather than insoluble nature of problem. Correct interpretation of such differences must await combination of optimum of material and method.—*C. C. Little.*

358. Eaton, S. V. [Rev. of: Dorsey, M. J. **Relation of weather to fruitfulness in the plum.** Jour. Agric. Res. **17**: 103–126. *Pl. 13–15, 1 fig.* June 16, 1919. (See Bot. Absts. **3**, Entry 1478.)] Bot. Gaz. **69**: 269. Mar., 1920.

359. Ebstein, A. **Zur Frage des Vorkommens von Kretinen und Albinos in Lehrbach im Harz.** [On the occurrence of cretins and albinoes in Lehrbach in the Harz.] Die Naturwissenschaften **6**: 561–565. 1918.

360. Eisenberg, P. **Untersuchungen über die Variabilität der Bakterien. VII. Über die Variabilität des Schleimbildungsvermögens und der Gramfestigkeit.** [Investigations on the variability of bacteria. VII. On the variability of the slime-building capacity and in Gram-reaction.] Centralbl. Bakt. Parasitenk. **82**: 401. 1918.

361. Everitt, P. F. **Quadrature coefficients for Sheppard's formula (c).** Biom. Vol. 1: p. 276. Biometrika **12**: 283. Nov., 1919.—This table gives constants necessary for rapid calculation of the area of a curve, from equally spaced ordinates.—*John W. Gowen.*

362. Findlay, Wm. M. **The size of seed.** North Scotland Coll. Agric. Bull. 23. *15 p.* 1919.—See Bot. Absts. 3, Entry 1361.

363. Fischer, E. **Die Beziehungen zwischen Sexualität und Reproduktion im Pflanzenreich.** [Relation between sexuality and reproduction in the vegetable kingdom.] Mitteil Naturf. Ges. Bern. **1918**: 1–4. 1918.

364. Fries, Rob. E. **Strödda iakttagelser över Bergianska Trädgardens gymnospermer.** [Miscellaneous observations on gymnosperms in the Bergian garden.] Acta Horti Bergiani [Stockholm] **6**: 1–19. *1 pl., 1 fig.* 19—.—The original specimen of *Larix americana* Michx. f. *glauca* Beissn. is characterized by chlorocarpy. Color of needles is certainly in large part blue-green (*glauca*). Shoots with typical light-green color are to be seen here and there, however, which is also shown in a colored plate. The cause of this fact, suggesting chimera-phenomena, is not as yet explained. Of *Picea Engelmannii* (Parr) Engelm., author describes a *virgata* and a *prostrata* form, both belonging to the *glauca* type. Teratological formations in the strobiles of *Larix decidua* are described.—Report is given on the winter-resistance of different kinds of needle-trees. Different observations concerning the process of flowering are given and discussed. *Pinus cembra*, *Picea nigra* and *Abies arizonica* seem during the individual life to have a ♀ stage preceding the androgynous stage. In *Pinus ponderosa* var. *scopulorum*, *Picea omorica* and *Abies concolor*, on the contrary, a ♂ stage seems to precede the stage with both sexes.—*K. V. Ossian Dahlgren.*

365. Fritsch, K. **Floristische Notizen. Über Rumex Heimerlii Beck und einige andere angebliche Tripelbastarde aus der Gattung Rumex.** [Floristic notes on Rumex Heimerlii Beck and several other supposed triple hybrids in the genus Rumex.] Österr. Bot. Zeitg. **67**: 249–252. 1918.

366. Frölich, G. **Abstammungs- und Inzuchtsforschungen. Dargestellt an der wichtigsten Blutlinie des weissen deutschen Edelschweines, Ammerländer Zucht.** [Pedigree and inbreeding investigations. Represented in the most important bloodlines of improved white German swine, Ammerland breed.] Kühn-Archiv 7: 52–129. *6 pl.* 1918.

367. Frölich, G. **Wichtigste Blutlinie des weissen deutschen Edelschweines, Ammerländer Zucht.** [Most important blood-lines of improved white German swine, Ammerland breed.] Deutsch. Landw. Presse. 46: 24. *12 fig.* 1919.

368. Frölich, G. **Die Beeinflussung der Kornschwere durch Auslese bei der Züchtung der Ackerbohne.** [The influencing of grain-weight by selection in the breeding of field beans.] Friedrichswerther Monatsber. 9: 7–8, 17–20. 1919.—See Bot. Absts. 5, Entry 268.

369. Frölich, G. **Die Umzüchtung von Wintergetreide in Sommergetreide.** [The breeding of winter cereals into spring cereals.] Friedrichswerther Monatsber. 9: 27–30. 1919.—See Bot. Absts. 5, Entry 267.

370. Frost, H. B. **Mutation in Matthiola.** Univ. California Publ. Agric. Sci. 2: 81–190. 1919.—Occurrence, characteristics and heredity of certain aberrant types of *Matthiola annua* Sweet are described. These aberrant forms resemble some of the "mutant" types produced by *Oenothera Lamarckiana*. It is highly probable that they are originally produced by mutation but it is uncertain whether aberrant individuals arise by immediate mutation or by segregation. Although the species is typically Mendelian with respect to various characters, yet individuals of the mutant types give erratic hereditary ratios suggestive of *Oenothera*. Six out of eight types studied have shown their heritability in progeny tests. Some of the types have been produced by many parents and in several pure lines isolated from the original commercial variety, "Snowflake."—Mutant types are in general inferior to Snowflake in vigor, fertility and various form and size characters. The early type is practically a smaller and earlier Snowflake and is probably due to a single dominant mutant factor. In five other types no true-breeding individuals have yet been found although it is known that in three of the types the mutant factor (or factors) is carried by both eggs and sperms; hence it appears that these mutant factors are imperfectly recessive for a lethal effect. Evidence is reported for linkage of three mutant factors with the factor pair for singleness and doubleness of flowers but selfing ratios suggest duplication of a chromosome (non-disjunction) as in *Oenothera lata*. Further study may help to explain the remarkable genetic behavior of *Oenothera* and *Citrus*.—*E. B. Babcock.*

371. Fruwirth, C. **Zum Verhalten der Bastardierung spontaner Variationen mit der Ausgangsform.** [The hybridization of a spontaneous variation with the original form.] Zeitschr. Pflanzenzücht. 7: 66–73. *2 fig.* June, 1919.—Author observed a spontaneous variation in color of seed coats of a spotted strain of narrow-leaved lupine (*Lupinus angustifolius*). This variation was a dilution of the color. It has bred true since 1911. Reciprocal hybrids were made between this dilute-colored form and the parent strain. In F_1 dilute color was dominant when maternal parent was dilute and recessive when the paternal parent was dilute. Segregation occurred in both hybrids in second and subsequent generations but behavior was very irregular.—*J. H. Kempton.*

372. Fruwirth, C. [German rev. of: Fruwirth, C. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. II. Die Züchtung von Mais, Futterrüben und anderen Rüben, Oelpflanzen und Gräsern. (Handbook of agricultural plant breeding. II. The breeding of maize, fodder beets and other root-crops, oil plants and grasses.)** *3rd. ed., 262 p., 50 fig.* Paul Parey: Berlin, 1918.] Zeitschr. Pflanzenzücht. 7: 144–145. Dec., 1919.

373. Fruwirth, C. **Die gegenwärtige Organisation der Pflanzenzüchtung in Deutschland und in Österreich-Ungarn.** [The present organization of plant breeding in Germany and Austro-Hungary.] Nachricht. Deutsch. Landw. Ges. Österreich 1919: 35–39. 1919.—See Bot. Absts. 5, Entry 269.

374. Fruwirth, C., Dr. Th. Roemer, and Dr. E. von Tschermak. **Handbuch der landwirtschaftlichen Pflanzenzüchtung. 4. Die Züchtung der vier Hauptgetreidearten und der Zuckerrübe.** [Handbook of agricultural plant breeding. 4. Breeding of the four chief cereals and the sugar beet.] *3rd. ed., 8vo., xv + 504 p., 42 fig.* Paul Parey: Berlin, 1918.—See Bot. Absts. 5, Entry 270.

375. Gassner, S. **Beiträge zur physiologischen Charakteristik sommer- und winterannueller Gewächse, insbesondere der Getreidepflanzen.** [Contribution to the physiological characteristics of summer and winter annuals with special reference to the cereals.] Zeitschr. Bot. 10: 417–480. *7 pl., 2 fig.* 1918.—See Bot. Absts. 5, Entry 271.]

376. Gassul, R. **Nachtrag zu meiner Mitteilung über "Eine durch Generationen prävalierende symmetrische Fingerkontraktur."** [Supplement to my contribution on a symmetrical contraction of the fingers prevailing through generations.] Deutsch. Mediz. Wochenschr. 44: 1196–1197. 1918.—See Also Bot. Absts. 4, Entry 578, and next following Entry, 378.

377. Gassul, R. **Eine durch Generationen prävalierende symmetrische Fingurkontraktur.** [A symmetrical contraction of the fingers prevailing through generations.] Deutsch. Mediz. Wochenschr. 44: 1197–1198. *2 fig.* 1918.—In a family from Mecklenburg-Schwerin three successive generations have produced individuals with permanent bilateral hyperextension of the basal phalanges of the fourth and fifth fingers. [See also next preceding Entry, 377.]—*C. H. Danforth.*

378. Gatenby, J. Bronté. **The cytoplasmic inclusions of the germ-cells. VI. On the origin and probable constitution of the germ-cell determinant of Apanteles glomeratus, with a note on the secondary nuclei.** Quart. Jour. Microsc. Sci. 64: 133–153. *1 pl., 10 fig.* Jan., 1920.—Author describes his attempts to determine the composition and origin of the germ-cell determinant in the oöcytes of the parasitic hymenopteran, *Apanteles glomeratus.* He finds that it arises as a concentrated area at the posterior pole of the young oöcytes; that it is probably formed of albuminous material rather than of chromatin, fat, yolk, or glycogen; and that the secondary nuclei have no connection with it.—*R. W. Hegner.*

379. Gatenby, J. Bronté. [Rev. of: Thomson, J. Arthur. **Heredity.** *3rd. ed., ix + 627 p., 47 fig.* John Murray: London, 1919.] Sci. Prog. 14: 517. Jan., 1920.

380. Geisenheyner, L. **Über einigen Panaschierungen.** [On some variegations.] Verhandl. Bot. Ver. Prov. Brandenburg 59: 51–61. *3 fig.* 1918.

381. Goebel, K. **Zur Kenntnis der Zwergfarne.** [To a knowledge of the dwarf ferns.] Flora 11–12 (Festschr. Stahl): 268–281. *6 fig.* 1918.—Describes dwarf mutants (?) from two spp. of *Aspidium*, one sp. of *Drynaria* (tropical), and two spp. of *Platycerium.* Mutation has not yet been directly observed in culture. Dwarfs are characterized by smaller and fewer cells, smaller or fewer bundles (or both), fewer sori, sporangia, and spores. Describes parallel investigation of dwarf mutant from *Salvia protensis.*—*Merle C. Coulter.*

382. Goldsmith, William M. **A comparative study of the chromosomes of tiger beetles (Cicindelidae).** Jour. Morph. 32: 437–487. *Pl. 1–10.* 1919.—Five species of *Cicindela* were studied, all of which conform to one type in regard to chromosome number and spermatogenesis. The male has a "double odd chromosome," the female two, making the formulae 20 + Xx=22♂, 20+Xx+Xx=24♀. In other Coleoptera two additional types are known, (1) 20+X+Y=22♂, 20+2X=22♀; and (2) 18+X=19♂, 18+2X=20♀. In *Cicindela* spermatogonia are in syncytial cysts; the spermatocyte growth period includes, in sequence, the usual diffuse, leptotene, synaptic (synizesis) and diplotene stages, giving rise to prophase bivalents. The Xx complex is a single compound body in first division, going undivided to one pole, giving two types of second spermatocytes. X separates from x in anaphase and both divide in second division. Spermatogonia each have one nucleolus, oogonia have two, corresponding to sex-chromosome relations. Early stages of oocyte growth period correspond in general to those of spermatocyte.—*Chas. W. Metz.*

483. Guyer, M. F., and E. A. Smith. **Studies on cytolysins. I. Some prenatal effects of lens antibodies.** Jour. Exp. Zool. 26: 65–82. 1918.—The lenses of freshly-killed rabbits were reduced to a pulp and diluted with normal salt solution, then injected into the peritoneal cavity of fowls. Serum obtained from such fowls, when injected into the blood-vascular system of pregnant rabbits, attacked the lenses of some of the uterine young, though without effect on the lenses of the mothers. The affected lenses were rendered opaque or liquid. Similar results were obtained in mice. The experiments demonstrate that specific structural modifications can be engendered in the young *in utero* by means of specifically sensitized sera. —*Bertram G. Smith.*

384. Haecker, V. **Vererbungsgeschichtliche Einzelfragen IV. Über die Vererbung extremer Eigenschaftsstufen.** [Historical genetical problems IV. On the inheritance of extreme character-gradations.] Zeitschr. indukt. Abstamm. Vererb. 21: 145–157. *2 fig.* Sept., 1919. —Various cases already in the literature are brought together in support of the following generalization: The extreme grades of a varying character will show agreement with the law of segregation, but the intermediate grades will not show such phenomena among themselves. The cases cited as evidence include height of peas, Mendel's short and tall vs. Bateson's dwarf and semi-dwarf; the relations of *Oenothera gigas* and *nanella* vs. those of *O. muricata* and *nanella*; stature in man (an original pedigree is given of one family involving a size cross); crosses between the blue and white varieties of flax, and between two species of somewhat different blues; much the same situation in *Veronica*; leaf color in Shull's *Lychnis*; spotting in mice and rats; and finally various examples from butterfly crosses. In attempting to provide some theoretical explanation to cover the situation in general, the multiple factor theory is found impossible without far-reaching supporting hypotheses. A *special* factor influencing the extreme plus and minus grades is not accepted because this phenomenon is so far-reaching in plants and animals, involving color as well as form, that there must be a *common* final cause behind all cases. Neither can the popular theory of linkage be called in to help without the special assumption that linkage is effective when strong concentrations of duplicate factors are present, and also when these factors are in greatly reduced numbers, but in the intermediate conditions the factors exhibit their independence. But this explanation is not satisfactory, and in the present state of the science the best one can do is to say that, "In continuously varying characters the extremes show a greater inclination to inheritable independence than do the intermediate grades." In other words, the germplasm determining the extreme grades is much more stable and independently heritable than that determining the intermediate grades. The article is concluded with a cursory discussion of the antagonistic relation between white and black with special reference to mosaic arrangements and to ontogenetic reversals; it is suggested that one condition of the germplasm may completely turn over into the other condition with proportional ease.—*E. C. MacDowell.*

385. Haecker, V. **Die Annahme einer erblichen Übertragung körperlicher Kriegsschäden.** [The supposition of a hereditary transmission of physical war injuries.] Arch. Frauenk. u. Eugenik. 4: 1. 1919.

386. Haecker, V. **Über Regelmässigkeiten im Auftreten erblicher Normaleigenschaften, Anomalien und Krankheiten beim Menschen.** [On regularity in the occurrence of hereditary normal characteristics, anomalies and diseases in man.] Mediz. Klinik. 14: 177. 1918.

387. Hammerlund, H. C. **Förädling av grönsaksväxter vid Weibullsholms Växtförädlingsanstalt.** [Improvement of green vegetables at the station for plant improvement of Weibullsholm.] *13 p., 7 fig.* W. Weibulls Illustrerade Årsbok (Landskrona) 15 (1920). 1919.—Gives an account of the results obtained and methods practised. Self-fertility has been found to be very unequal for different sorts of cabbage, and seems also to vary for other kinds of green vegetables. In parsnips self-fertility seems however in general to be very effective.—*K. V. Ossian Dahlgren.*

388. Hansen, W. **Einiges über Rübenzucht.** [Something about beet-breeding.] Landw. Zeitung 39: 154–156. 1919.—See Bot. Absts. 5, Entry 272.

389. H[arland], S. C. **A note on a peculiar type of rogue in Sea-Island cotton.** Agric. News [Barbados] 19: 29. 1920.—A distinct type characterized by great reduction in size of all the organs and nearly complete sterility, constitutes about 0.05 per cent of plants in fields of Sea Island cotton in St. Vincent. No viable pollen is produced and seeds are very rarely developed. Plants grown from two seeds borne on a "rogue" plant, representing therefore F_1 of cross with Sea Island, had all characters of latter. A self-fertilized strain of Sea Island, which had produced hitherto only normal plants, gave rise in fourth selfed generation to rogue plants in 4 out of 62 progenies, the average percentage of rogues having been 1.6.—*T. H. Kearney.*

390. Heribert-Nilsson, H. N. **Ett försök med urval inom pedigreesorter av havre. [An experiment with selection among pedigree-varieties of oats.]** *4 p.* W. Weibulls Illustrerade Årsbok (Landskrona) 15 (1920). 1919.—Of the Danish "Tystofte Gulhvid," by pedigree selection, a new and more productive variety "Weibull's Fortunahavre" was obtained. Here is of special interest that selection within the pedigree variety "Tystofte Gulhvid" has given such a surprisingly good result. This shows that the mother variety "Tystofte Gulhvid," must either not have been homogeneous, although secured by pedigree selection, or the original plant of "Fortuna" oats must represent a mutation. Under high humidity combined with high temperature author has observed that the oat flowers are able to open and, contrary to the usual rule, disperse their pollen. Cross-fertilization thus is not excluded in oats, which as a rule however is an autogamous plant. The author also considers as most probable that the individual used as mother plant had its genotype changed by a new combination.—*K. V. Ossian Dahlgren.*

391. Hoffmann, Hermann. **Geschlechtsbegrenzte Vererbung und manisch-depressives Irresein. [Sex-linked inheritance and manic-depressive insanity.]** Zeitschr. ges. Neurol. Psych. 49: 336–356. 1919.—Author reviews suggestion of Lenz that certain diseases represent dominant sex-linked characters and develops the theoretical expectations for this form of heredity. One of the critical requirements in these cases is that a father characterized by a dominant sex-linked trait should produce only normal sons and affected daughters. Lenz mentioned manic-depressive insanity as possible example of this type. Author finds that in general the heredity of the diathesis does conform approximately to theoretical expectations based on Lenz's hypothesis, but there are numerous exceptions. Twelve such exceptional family histories are presented in some detail. In these families where affected men have married presumably normal women there have been produced instead of all normal sons twenty-four affected and two normal, from which it is concluded that manic depressive insanity does not present an entirely satisfactory example of dominant sex-linked heredity.—*C. H. Danforth.*

392. Hopkins, L. S. **A crested form of the lady fern.** Amer. Fern Jour. 9: 86–88. *Pl. 4.* 1919.

393. Jehle, R. A., and others. **I. Control of cotton wilt. II. Control of cotton anthracnose and improvement of cotton.** Bull. North Carolina Dept. Agric. 41[1]: Supplem. 5–28. *Fig. 1–6 and 1–5.* 1920.—See Bot. Absts. 5, Entry 747.

394. Jelinek, Dr. **Nächste Aufgaben der Pflanzenzüchtung und der Sortenprüfung. [The next problems of plant breeding and variety testing.]** Zeitschr. Pflanzenzücht. 7: 83–90. Dec., 1919.

395. Kajanus, H. B. (1) **Weibullsholms Ambrosia-kokärt.** *1 p.* (2) **Weibulls Kolibri-fodervicker.** *2 p., 2 fig.* (3) **Weibulls Tardus-Hundäxing.** *2 p., 2 fig.* W. Weibulls Illustrerade Årsbok (Landskrona) 15 (1920). 1919.—New and productive sorts of *Pisum sativum*, of *Vicia sativa*, and of *Dactylis glomerata* are described: the last flowers about two weeks later than the common sorts.—*K. V. Ossian Dahlgren.*

396. Kammerer. Geschlechtsbestimmung und Geschlectsverwandlung. Zwei gemeinverständliche Vorträge. [Sex determination and sex modification. Two popular lectures. *96 p., 16 fig.* Perles: Wien, 1918.

397. Kammerer, K. Mischling. [Hybrids.] Ornith. Monatshefte. 43: 31–32. 1918.

398. Kammerer, Paul. Das Gesetz der Serie. Eine Lehre von den Wiederholungen im Lebens- und im Weltgeschehen. [The law of series. A doctrine of the repetition in life- and world-phenomena. *17 × 24.5 cm., 486 p., 8 pl., 26 fig.* Deutsche Verlang-Anstalt: Stuttgart, Berlin, 1919.

399. Kiessling, L. Die Leistung der Wintergerste und deren züchterische Beeinflussung. [The performance of winter barley and its modification by breeding.] Illustr. Landw. Zeitung 1919: 310–311. 1919.—See Bot. Absts. 5, Entry 283.

400. Klatt, B. Vergleichende metrische und morphologische Grosshirnstudien an Wild- und Haushunden. [Comparative metrical and morphological studies on the cerebrum of wild and domesticated dogs.] Sitzungsber. Ges. Naturf. Freunde. 1918: 35–55. 1918.

401. Klatt, B. Experimentelle Untersuchungen über die Beeinflussbarkeit der Erbanlagen durch den Körper. [Experimental investigations on the modifiability of the hereditary factors through the soma.] Sitzungsber. Ges. Naturf. Freunde. 1919: 39–45. 1919.

402. Knibbs, G. H. The problems of population, food supply and migration. Scientia 26: 485–495. 1919.—Popular mathematical paper showing that the present world's population increase is too rapid when compared with possibilities of increasing the food supply.—*E. M. East.*

403. Kottur, G. L. An improved type of cotton for the southern Maratha country (Bombay Presidency, India). Agric. Jour. India 14: 165–167. *1 pl.* 1919.

404. Kraus, and L. Kiessling. Die Landsortenzüchtung in Bayern. [Breeding of local varieties in Bavaria.] Deutsch. Landw. Presse 1918: 247. 1918.

405. Kroemer, K. Das staatliche Rebenveredelungswesen in Preussen. [State grape-improvement project in Prussia.] Landw. Jahrb. 51: 1–292. *8 pl., 43 fig.* 1918.

406. Kronacher, C. Die deutscher Schweinezucht und Haltung nach dem Kriege. [German swine breeding and maintenance after the war.] Flugschr. Deutsch. Ges. Züchtsk. 1918: 47. 1918.

407. Kronacher, C. Beitrag zur "Erbfehler" Forschung in der Tierzucht mit besonderer Berücksichtigung des Rorens beim Pferde. [Contribution to investigation of hereditary defects in animal breeding, with special reference to "Rorens" in horses.] Flugschr. Deutsch. Ges. Züchtungsk. 1918: 1–32. 1918.

408. Kronacher, C. Allgemeine Tierzucht. Ein Lehr- u. Handbuch für Studierende u. Züchter. 4. Abteilung (Abschnitt VI des Gesamtwerkes): Die Züchtung. [General animal breeding. A text and handbook for students and breeders. 4th part (Section VI of the complete work): Breeding. *8vo, 357 p.* Paul Parey: Berlin, 1919.]

409. Lenz, Fritz. Über dominant-geschlechtsbegrenzte Vererbung und die Erblickkeit der Basedowdiathese. [Dominant sex-linked heredity and the inheritance of the Basedow diathesis.] Arch. Rassen u. Gesellschaftsbiol. 13: 1–9. *5 fig.* 1918.—The fact that certain sex-linked traits are recessive carries with it the corollary that allelomorphic traits are sex-linked dominants. Biologically there is no essential difference between normal and disease-favoring determiners, and consequently dominant sex-linked diseases might be expected. Such diseases, instead of being very rare in the female, should be twice as frequent as in the male.

Affected females mated to normal males should produce in equal numbers both normal and affected sons and daughters while affected males mated to normal females should produce only normal sons and affected daughters. The incidence of several diseases of man, including Basedow's, approximate the expectations for dominant sex-linked traits. That they are such can not be stated with assurance till further data shall have been accumulated. It is the purpose of this paper to point out the possibility of dominant sex-linked traits and to indicate their expected mode of inheritance.—*C. H. Danforth.*

410. Lillie, Frank Rattray. **Problems of fertilization.** *13 × 19 cm., xii + 278 p., 19 fig.* Univ. Chicago Press: Chicago, 1919.—Author distinguishes two phases of fertilization, rejuvenescence, and combination of inheritance from two parents. Latter is only feature common to all cases of fertilization. Morphology of fertilization is described. Chromosome equivalence of egg and sperm is emphasized. Origin of centrosome in fertilized egg is regarded as physiological rather than morphological. There is no evidence that mitochrondria of sperm have any function in heredity. Pathological polyspermy strongly supports nuclear theory of heredity.—Behavior of sperm under various circumstances is described, especially in response to chemical stimuli, including those originating in egg. Agglutination of sperm is due to substance in sperm, which is specific in its action. Approach of sperm to egg is not due solely to random activity, nor to chemotactic orientation alone, but to combination of different types of behavior. Gametes must both be in definite condition before fertilization may occur, and that condition lasts variable time in different species. Sperm owes its power of fertilization to a substance, not to its motility, and this substance may also be responsible for agglutination. Egg also owes fertilization capacity to hypothetical substance (fertilizin). Fertilization is accompanied by increase in rate of oxidation, changes in permeability, changes in colloidal condition, and chemical alterations. Fertilization involves long series of events, some cortical, some internal, and process may be arrested in middle, making fertilization partial. Such incomplete activation of egg results sooner or later in arrest of development.—Tissue specificity in fertilization is demonstrated when spermatozoa fail to enter accessible cells other than ova. Species specificity is shown by hybrid fertilization in echinoderms, teleosts, and Amphibia, and by self-fertilization in various animals. Such hybridization experiments demonstrate some non-specific and some specific factors. Latter are found in cortical reactions of egg. If cortical barrier is passed by foreign sperm, fertilization proceeds normally. In plants, sterility is due to inhibition of growth of pollen tube, not to incompatibility of gametes, and in some cases sterility factors are known to be inherited. Specificity is doubtless due to chemical phenomenon, problem related to agglutination of sperms. Analogy with immunity reaction is pointed out, but with warning that these phenomena may be fundamentally unlike.—Activation involves two phases, cortical and internal. Agglutination of sperm to egg is first step in cortical phase, and is due to agglutinating substance (fertilizin). This substance is combined on entrance of one sperm, and egg does not react to other sperms. Author criticises Loeb's view that activation of egg is due to cortical cytolysis; discusses increase of oxidation, also gelation and liquefaction of cortical protoplasm, and electrical polarization. Internal phase of activation mainly relates to preparation for karyokinesis.—*A. Franklin Shull.*

411. Lundborg, H. **Befolkningsstudier i Norrbotten och nordliga Lappland särskildt inågra fjällbyar av Torne sjö. [The structure of population in Norrbotten and in the northeast part of Lappland, specially in some mountain villages near Lake Torne.]** Ord och Bild [Stockholm] 28: 641–648. *11 fig.* 1919.—Author describes how the Lapponians are going over to settle in houses and the social and race biological consequences of this change. Crossings between Swedes, Finlanders and Lapponians are not uncommon. The lowest and poorest part of the population includes as a rule Lapponians and half-blood Lapponians; the middle part are Finlanders; the upper portion consists of Swedes or Swede Finlanders. The younger a village is and the more westward up to the mountain it is situated, the more the Lapponians or Lapponian Finlandian elements dominate. The reason for this difference in the structure of population depends undoubtedly upon the race inequalities or differences in cultural qualification of the tribes in question.—*K. V. Ossian Dahlgren.*

412. Lundborg, H. Olika folk och kulturer, sedda i rasbiologiskt ljus.—Internationell Politik. [Different peoples and cultures in race-biological light.] *125 × 200 mm., 8 p.* Stockholm, 1919.—Author treats the consequences of (1) inter-marriages, (2) extreme mixing of races, (3) marriages within the same tribe (inter-marriages in its wide sense) and (4) race-mixings between related peoples.—*K. V. Ossian Dahlgren.*

413. Lundborg, H. Om modern ärftlighetsforskning med särskild hänsyn till människan. [On modern inquiry into heredity with special consideration to mankind.] Ord och Bild [Stockholm] 28: 186–196. *4 fig.* 1919.—Popular treatise.—*K. V. Ossian Dahlgren.*

414. Lundborg, H. En svensk bondesläkts historia sedd i rasbiologisk belysning.—Svenska Sällskapets för Rashygien skriftserie II. [The history of a Swedish peasant family in eugenical light. No. II. of the papers of the Swedish Eugenical Association. *138 × 215 mm., 40 p., 8 fig.* P. A. Norstedt & Söners Förlag: Stockholm, 1920.—Author first discusses genealogical investigation as a cultural subject. Especially in Sweden it might be possible to practise genealogical inquiries on a greater scale, because the registration of the inhabitants of Sweden since centuries ago is more complete than in any other country. The "hüsförhörsböcker" are especially important, because in these books on the same page are noted whole families. After a small chapter on "genealogical principles" the author proceeds to a popular description of his investigation on the Lister family. This family was extensively discussed in author's great work "Medizinisch-biologische Familieforschungen innerhalb eines 2232-köpfigen Bauergeschlechtes in Schweden," Jena 1913.—*K. V. Ossian Dahlgren.*

415. Lynch, Clara J. An analysis of certain cases of intra-specific sterility. Genetics 4: 501–533. *2 fig.* Nov., 1919.—Analysis of sterility in certain mutant races of *Drosophila melanogaster*. Fused is sex-linked recessive. Males are fertile with normal or heterozygous females; fused females produce no offspring when mated to fused males, only a few (and these all daughters) when mated to normal males. XXY fused females, mated to normal males, produce a few sons, but these are all non-disjunctional exceptions. Hence fused gene acts to prevent eggs from developing, but this action may be inhibited by its normal allelomorph, either before maturation (in heterozygous female) or after fertilization (in not-fused offspring of fused female). Rudimentary, another sex-linked recessive, acts in same way as fused, but not so completely, as rudimentary females produce a few rudimentary offspring. Morula, reduced bristle, dwarf (autosomal recessives) have sterile females and fertile males. Dibro (autosomal recessive) apparently sterile in both sexes. Cleft (sex-linked recessive) has sterile males, and females have never been obtained. In none of the cases studied was it possible to isolate a sterility gene independent of the mutant gene itself. Sterility is probably one of the effects of these mutant genes.—*A. H. Sturtevant.*

416. Macoun, W. T. Blight resistant potatoes. Canadian Hortic. 42: 129–156. 1919.—See Bot. Absts. 3, Entry 1644.

417. MacBride, E. W. The inheritance of acquired characters. Nature 103: 222. May 22, 1919.—Refers to recent work of Kammerer published in Archiv für Entwicklungsmechanik, 1919, extending earlier experiments with *Alycetes*, the "mid-wife" toad. These normally pair on land, the horny patch on the hand of the male, characteristic of water-breeding Anura, being absent. Kammerer had previously found that *Alycetes* subjected to a higher temperature, paired in water, and that the F_1 and F_2 generations developed the horny patch, even when returned to a terrestrial environment. It is now found that the patch persists in the F_6 generation.—McBride deprecates certain criticisms of the work of Kammerer and is inclined to support the results as evidence toward the inheritance of acquired characters. He notes that arrangements for a repetition of the experiment in the Zoological Gardens, are being made, although a minimum of six years will be required.—Although author is inclined to challenge Mendelians in connection with the results achieved by Kammerer, experiments with *Drosophila*, particularly where abnormal abdomen develops, are suggestive that a common explanation may underlie both phenomena.—*L. B. Walton.*

418. Meader, Percy D. **Variation in the diphtheria group.** Jour. Infect. Diseases 24: 145-157. 1919.—Author's material consisted of 25 different strains of the diphtheria bacillus, isolated, for the most part, from throats of persons infected with diphtheria during epidemic of the disease. Pure cultures were made of each strain by repeated plating on agar. From each pure culture a series of subcultures were made by plating dilutions so prepared that as far as possible each colony represented the progeny of a single organism. Repeated subcultures were made from selected colonies of each strain. Progeny of the various colonies were examined in 20 hour slant cultures on Loeffler's serum stained with Loeffler's methylene blue. The frequency of the various Wesbrook types of morphology were tabulated for the original type of each strain and for the progeny of each type. Employing as a criterion of variability in type the fact that the predominating types of morphology present in subcultures were different from those present in the original culture, the author found that of his 25 strains 8 showed morphologic variation, 4 may have varied only slightly, if at all, and 13 showed no reasonable indication of variation.—To determine fermentative variability, each of the 25 strains were compared with their descendants after the 5th and 10th platings as regards their power to produce acid in dextrose, lactose, maltose, dextrin, and saccharose. More than half of the cultures investigated varied after successive platings as regards their power to produce acid in carbohydrates.—Variability of virulence of the 25 strains was tested by means of the inoculation into guinea pigs of each original type and of its progeny after the 5th and 10th platings. Some strains gained virulence, some lost it and some remained constant in the course of successive platings. Variations in virulence were only in part correlated with morphologic types. Cultures containing granular forms were frequently non-virulent, while those which consisted of solid-staining forms for the greater part of their cultivation were consistently non-virulent.—From a biometric study of the fermentative reactions of members of the diphtheria group it appears that they constitute a genetically related group of organisms. In subcultures derived from one parent strain variations in morphology, in fermentative reactions and in virulence, occur, but the virulence of a strain is not correlated with its fermentative reactions nor closely correlated with its morphology.—*M. A. Barber.*

419. Meunissier, A. **De quelques idées sur la selection des légumes. [Some ideas on the selection of vegetables.]** Rev. Hortic. 91: 300-303. June, 1919.—See Bot. Absts. 5, Entry 1855.

420. Meves, G. **Eine neue Stütze für die Plastosomen theorie der Vererbung. [A new support for the plastosome theory of heredity.]** Anat. Anzeig. 50: 1918.

421. Molz, C. **Natürliche und künstliche Auslese zur Erzielung widerstandsfähiger Sorten. [Natural and artificial selection for the achievement of resistant varieties.]** Deutsch. Landw. Presse 1918: 19. 1918.

422. Morgan, Thomas Hunt. **The physical basis of heredity.** *14x21 cm., 300 p., 117 fig.* J. B. Lippincott Co.: Philadelphia, 1919.—A presentation of the modern factorial theory of heredity, comprising the phenomena of segregation, independent assortment, linkage and crossing over, the linear arrangement of the genes, interference, and the limitation of the linkage groups. Both the genetic evidence and the cytological are presented, and it is shown how the genetic phenomena are explained by the chromosome mechanism. On the basis of these principles an analysis is given of sex and sex-linked inheritance, non-disjunction, parthenogenesis and pure lines, cytoplasmic and maternal inheritance. There is a discussion of variation in linkage caused by hereditary factors and by environmental conditions. The chapter on "Variation in the number of the chromosomes and its relation to the totality of the genes" deals with triploidy and tetraploidy, and recent work indicating deficiency, duplication of factors in a chromosome, and transposition of factors from one chromosome to another. The chapter on mutation includes the explanation of pseudo-mutations by balanced lethals. In "The particulate theory of heredity and the nature of the gene" the author discusses the relation of the genetic factor or gene to somatic characters and to ontogeny.—*Alexander Weinstein.*

423. Morgan, T. H. **Contributions to the genetics of Drosophila melanogaster. IV. A demonstration of genes modifying the character "notch."** Carnegie Inst. Washington Publ. 278. *P. 343–388. 1 pl., 15 fig.* Washington, D. C. 1919.—Notch is a dominant sex-linked gene affecting wings, lethal when homozygous; consequently all notch flies are female and heterozygous. Mass selection in the direction of slight notching, carried out through 24 generations of *Drosophila melanogaster*, resulted in marked change in direction of selection. Extreme selected females, out-crossed to wild-type flies, gave ordinary notch in first generation, showing notch gene unmodified. Linkage relations demonstrated results of selection due to recessive modifying factor in second chromosome. Second experiment (19 generations) gave similar results; crosses showed effect due to same modifier in both cases.—A modification in opposite direction, called "short notch," appeared several times; outcrosses to wild flies gave ordinary notch. Linkage relations showed this modification due to recessive modifier in first chromosome.—Notch gene is always necessarily heterozygous, but all results show no "contamination" by its normal allelomorph. Other mutations, modifying wings in somewhat similar or different ways, were all located in other chromosomes or different loci in X chromosome, thus showing them independent of notch.—High sex-ratios (76:1 and 119:10), given by two notch females, were undoubtedly due to lethal mutation in not-notch X chromosome, as shown in other cases. Only those few sons having crossover X survive.—*C. R. Plunkett.*

424. Morgan, T. H., and C. B. Bridges. **Contributions to the genetics of Drosophila melanogaster. I. The origin of gynandromorphs.** Carnegie Inst. Washington Publ. 278. *122 p., 4 pl., 10 fig.* Washington, D. C. 1919.—The genetic situation in *Drosophila melanogaster* made possible experimental demonstration of causes of production of mosaics and gynandromorphs (sex-mosaics). Principal recent theories are: delayed fertilization of one cleavage nucleus (Boveri 1888); development from a supernumerary sperm (Morgan 1905); and chromosomal elimination, i.e., elimination of one X chromosome from one of daughter cells at an early embryonic division (Morgan 1914). Critical evidence is obtained when gynandromorphs are hybrids of known sex-linked characters, and also contain known autosomal characters. A number of such cases, all described in detail, all show male and female parts differ by sex-chromosome only. The elimination theory is only possible one in these cases, and covers all but very few gynandromorphs in *Drosophila*.—Gynandromorphs start as females; a striking preponderance of female parts is found, as expected on elimination theory. Starting as a male is theoretically possible, but not indicated in any known cases. Starting as XX female, the male parts will be XO, therefore sterile (as shown in primary non-disjunction); except in case of XXY (non-disjunctional) individuals, where male parts will be XY, fertile. All evidence from gynandromorphs with male abdomen and testes supports these predictions. —Earlier theories of gynandromorphs are critically considered. The only one besides elimination found necessary to employ, in a few cases, is the theory of bi-nucleated eggs. Doncaster has found such eggs in *Abraxas*.—Both gonads of same individual are always alike; which is expected if germ plasm of *Drosophila* arises from single cell, as in *Miastor*, *Chironomus*, *Calliphora*, and other flies.—Only one certain case was found of a somatic mosaic, i.e., one not involving sex-chromosome; may be accounted for by autosomal elimination or bi-nucleated egg. Rarity may be due to failure of autosomal elimination or to inviability of such flies.—Ten somatic mutations described are all males, of which nine look like known sex-linked characters. This is in accord with expectation, if mutation occurs in only one chromosome of a pair, as is highly probable; since visible sex-linked mutations are four times as frequent as all dominants. Mosaics in plants are discussed; somatic mutation or chromosome elimination the most probable explanations in most cases.—All known gynandromorphs of Drosophila are thoroughly treated as to parentage, description, and explanation, with figures and diagrams of chromosomes. The great majority are adequately explained by simple X elimination, including a number from XXY mothers. Many are approximately bilateral, others largely antero-posterior, some mainly female, a few mainly male, and a few very irregular. In all, the male and female parts and their characters are strictly self-determining. No region, however small, is interfered with by neighboring parts or action of the gonad. The few cases not explicable by simple elimination are most simply explained as binucleated

eggs; but on this view there should be as many autosomal mosaics as gynandromorphs of this type, which is not the case. An alternative explanation is non-disjunction, followed by either "somatic reduction" or double elimination in a cleavage division; no critical evidence to decide between these views.—Gynandromorphs in other animals are discussed at length. In bees, both Eugster and von Engelhardt gynandromorphs can be accounted for by chromosomal elimination, so far as the evidence goes. In moths, those cases where sex-linked factors furnish critical evidence can be explained by chromosome elimination; here the gynandromorphs start as males (ZZ). This explanation applies to two mosaics in *Abraxas*. Toyama's gynandromorphs in silk-worms can be explained as bi-nucleated eggs. Goldschmidt's mosaics in the gypsy moth can not be explained because there are no sex-linked factors involved.—In Crustacea, molluscs, and some worms (e.g., *Bonellia*) external conditions and age seem, in some cases, to be factors in determining sex; there may be genetic factors that determine sex under ordinary, or other, circumstances.—In birds, a few bilateral gynandromorphs are known. Internal secretions of the ovary are known to suppress male secondary sexual characters in most cases. Apparently particular differences, in some species, are not influenced.—In man and other mammals, cases of gynandromorphs are known. Mechanism of sex determination is the same as in *Drosophila*. Modification by hormones also possible. Freemartin caused by male sex-hormone, through common circulation, suppressing normal development of ovary (Lillie). Possibility is suggested that cancer may be conditioned by inherited gene or genes liable to frequent somatic mutation or chromosome aberrations.—*C. R. Plunkett.*

425. Mosséri, V. M. Egyptian cottons: Their deterioration and means of remedying it. Bull. Union Agric. Egypte 16: 53–79. 1918.—Supposed greater resistance to "pink boll worm" (*Pectinophora gossypiella*) of certain varieties of cotton in Egypt said to be due merely to greater precocity. In India, supposed home of this insect, however, native cottons appear really more resistant than introduced Egyptian cotton. Deterioration of varieties grown in Egypt believed to be caused by mixing of seed and by natural hybridization, rather than by any process of spontaneous degeneration. Three methods of procedure are suggested for improvement of Egyptian cotton crop: (1) "Mendelian synthesis" as practiced by Balls; (2) selection and roguing to increase uniformity of existing varieties; (3) isolation of desirable mutants which originate new varieties.—*T. H. Kearney.*

426. Myerson, Abraham. **Mental disease in families.** Mental Hygiene 3: 230–239. Apr., 1919.—Author used records of Taunton State Hospital from 1854 to 1916 covering 16,000 persons, of whom 1547 were related. He compared the marriage rate of four groups—alcoholic insanities, general paresis, dementia praecox and senile dementia. In the first three groups the percentage of married males was found to be less than for females, in the seniles the reverse was true. The dementia praecox group showed the lowest fertility as compared with the total population. He concludes that marriage acts as barrier to propagation of endogenous diseases, such as dementia praecox, but not against exogenous, such as syphilis.—The preponderance of insane women recorded may be accounted for on the theory that women transmit their mental peculiarities to their female children more than to their male, but there is a more obvious explanation. Since men migrate to other districts more than women, female descendants are more likely to appear in a given asylum. The data at this particular institution show the mother-daughter group to be the largest and sisters decidedly outnumber brothers.—Notwithstanding the numerous factors tending to discount the actual meaning of the figures, author considers it probable that descendants of insane who themselves become insane do so at an earlier age than their ancestors and are tending to reproduce themselves in smaller proportion.—With regard to the character of transmission his findings lead him to believe that (1) The paranoid type of psychosis gives either paranoid or dementia praecox. (2) Dementia praecox gives dementia praecox or feeblemindedness. (3) Manic depression gives manic depression or dementia praecox. (4) Involution psychosis gives dementia praecox. (5) Senile psychosis gives any form of psychosis, imbecility or epilepsy.—Thus all roads seem to lead to dementia praecox and thence to feeble-mindedness.—His results further indicate that insanity among siblings tends to be similar, and that it is more often associated

with low-grade mentality than superior. This is at variance with the popular notion of the close relationship between genius and insanity.—The high incidence of tuberculosis with insanity often leads to mistaken inferences.—The extreme frequency of tuberculosis in the total population must be remembered as well as the fact that the insane, by reason of their deterioration, tend to live in conditions predisposing to the disease.—Two other students, Koller and Diem, discovered that insane aunts and uncles occur as frequently in families of sane as of insane and that, therefore, collateral insanity is relatively unimportant unless associated with parental insanity.—These studies demonstrate that our knowledge is inadequate to warrant theories of neuropathic heredity and how imperative such research is.—*Miriam C. Gould.*

427. Nachtsheim, H. Der Mechanismus der Vererbung. [The mechanism of heredity.] Naturw. Wochenschr. 18: 105–114. 1919.

428. Nachtsheim, H. Berichtigung. [A correction.] Zeitschr. indukt. Abstamm. Vererb. 20: 295. 1919.

429. Nakahara, Waro. A study on the chromosomes in the spermatogenesis of the stonefly, Perla immarginata Say, with special reference to the question of synapsis. Jour. Morphol. 32: 509–529. *Pl. 1–3.* 1919.—Ten chromosomes appear in the spermatogonia division. The chromosome group consists of two pairs of V's, a pair of rods, two spherules (m-chromosomes), and two unpaired rods, one of which is much longer than the other. These last are interpreted as the X- and Y-chromosomes, respectively. Preparatory to the first spermatocytic division a double spireme forms out of the resting nucleus, and this process the author interprets as a precocious split for the second spermatocytic division, which follows the first without a resting stage. Homologous chromosomes are connected to each other telosynaptically in the spireme; later, the members of each pair bend toward each other at the synaptic point and become reunited parasynaptically before the metaphase, thus forming rings and tetrads.—*Bertram G. Smith.*

430. Nelson, J. C. Monomorphism in Equisetum Telmateia Ehrh. Amer. Fern Jour. 9: 93–94. 1919.

431. Nicolas, G. Variations de l'androcée du Stellaria media L. en Algérie. [Variations of the androecium of Stellaria media L. in Algeria.] Bull. Soc. Hist. Nat. Afr. Nord. 9: 135–137. 1918.

432. [Norstedt, C. T. O.] [Rev. of: Harms, U. Über die Geschlectsvertheilung bei Drya octopetala L. nach Beobachtungen in Kgl. Botanischen Garten Berlin-Dahlem. (Concerning sex ratios in Drya octopetala in the Kgl. Botanical Garden Berlin-Dahlem.) Ber. Deutsch. Bot. Ges. 36: 292–300. *Fig. 5–10.* 1918.] Bot. Notiser 1918: 247. 1918.

433. Northrop, J. H. Concerning the hereditary adaptation of organisms to higher temperature. Jour. Gen. Physiol. 2: 313–318. 1920.—The experiments described were performed with races of *Drosophila* raised on sterile yeast cultures and handled with bacteriological care to prevent the entrance of bacteria into the breeding flasks. The incubators employed to maintain the higher temperatures were controlled within 0.2° to 0.3°C. of the desired temperatures by means of an original device regulating the flow of water through the jackets. *Drosophila* will develop at 32.5°C.; the rate of development increases from 10° up to 27.5°, but from 27.5° the rate falls. If the higher temperature in which a fly is raised occasions a lasting adaptation, it would be expected that eggs from such a fly would show increased resistance to high temperature. It was found that flies raised at 20°C. produce eggs that are capable of full development when raised in temperatures 29° and 32°C., but when raised in a temperature of 33° they will not go beyond the pupal stage. Flies raised in incubators at 32° produce eggs that will develop into adults when raised at 29°, but at 32° and 33° they will not even form larvae. The difference in these two sets of results is not due to deleterious effects

of increased temperature upon the eggs before they are laid, because the flies raised at 20° did not tend to produce eggs any less resistant after they had been laying in the high temperature for a week or 10 days. Cultures of flies could not be held at 30° for successive generations; but if the adults of each generation were removed from high temperature for 24 hours or more within a week after they hatched, the culture could be continued for the rest of the time at this temperature. One culture was continued in 30° by means of this intermittent cooling for ten generations and another culture was raised for 15 generations uninterruptedly at 28°; in neither case did there appear any sign of adaptation. The flies were still unable to produce more than one generation at a continuous temperature of 29° or over. "There is no evidence of any hereditary adaptation to higher temperature."—*E. C. MacDowell.*

434. Oberstein, O. **Über das Vorkommen echter Knospenvariationen bei pommerschen und anderen Kartoffelsorten.** [Occurrence of true bud variation in Pommeranian and other varieties of potato.] Deutsch. Landw. Presse **1919**: 560–561. *1 pl.* 1919.—See Bot. Absts. 5, Entry 296.

435. Ohly. **Züchterische Beobachtungen in einer Merinofleischschafherde.** [Breeding observations in a Merino sheep herd.] Mitteil. Deutsch. Landw. Ges. **1918**: 235. 1918.

336. Pascher, A. **Oedogonium, ein geeignetes Objekt für Kreuzungsversuche an einkernigen haploiden Organismen.** [Oedogonium, a suitable object for the study of crossing in uninucleate haploid organisms.] Ber. Deutsch. Bot. Ges. 36: 168–172. 1918.—Importance of study of results of crossing haploid organisms is emphasized, as illustrated by the work of Burgeff with *Phycomyces* and of Pascher with *Chlamydomonas*. Author reports successful crosses between two species of *Chara* and between two species of *Spirogyra*. After a discussion of the advantages, disadvantages, and difficulties offered by various groups of algae for work of this nature, it is reported that species of *Oedogonium* have shown themselves very favorable for hybridization experiments. Most species of this genus are easily cultivated; the isolation of single filaments and the bringing them together in desired combinations within a confined space, such as a small tube, offer no difficulties; the filaments with maturing oospores can be transferred to agar, where they readily complete their development; the zoospores of different species are marked by characteristic differences in such respects as the shape of the cell as a whole and the form of the anterior end; and the oospore, on germinating, gives rise to four zoospores, whose nuclei result from the reduction divisions, and which resemble, except in size, the zoospores produced by vegetative cells of the same species. In making a cross, the female at least must belong to a dioecious species. Probably dioecious forms with dwarf males are especially suitable. In cultures containing several species, the author has found forms which, especially in the characters of the oospores, betrayed a hybrid nature. It is probable that some forms which have been described as species were really hybrids. A list of species of *Oedogonium* is given which are recommended for experiments in hybridization.—*C. E. Allen.*

437. Pearl, Raymond. [Rev. of: East, Edward M., and Donald F. Jones. **Inbreeding and outbreeding: their genetic and sociological significance.** *14 x 21 cm., 285 p., 46 fig.* J. B. Lippincott: Philadelphia, 1919.] Science **51**: 415–417. April 23, 1920.—See Bot. Absts. 4, Entry 571.

438. [Pearson, Karl.] **Quadrature coefficients.** Biometrika **12**: 000. Nov., 1919.—Formulae from Biometrika I, p. 276, are reprinted as preface to a table by P. F. Everitt to facilitate the calculation of areas within a curve.—*John W. Gowen.*

439. Petrén, A., and others. **Angaende skrivelse till Konungen med begäran om utredning och förslag i fräga om upprättandet av ett svenskt rasbiologiskt institut.—Motion n:o 7 i Första Kammaren.** [Concerning a writing to the Swedish government proposing an extrication of and a project to establish a Swedish eugenical institute. Motion n:o 7. in the first Chamber of the parliament. Bihang till riksdagens protokoll 1920. *190 x 225 mm., 27 p.* Stock-

holm, 1920.—Mentions reasons for and importance of establishing a race-biological institute. Parliament is asked to demand a special proposal for the organization of such an institute.—*K. V. Ossian Dahlgren.*

440. Piltz, J. **Über homologe Heredität bei Zwangsvorstellungen.** [On homologous heredity in hallucination.] Zeitschr. ges. Neur. u. Psych. **43.** 1918.

441. Plunkett, C. R. **Genetics and evolution in Leptinotarsa.** Amer. Nat. **53**: 561–566. Nov.–Dec., 1919.—Tower's work is almost entirely in agreement with the modern Mendelian theory of heredity. Where there is apparent disagreement, critical evidence is lacking because of Tower's failure to subject the individuals he worked with to a rigorous genetic analysis.—*Alexander Weinstein.*

442. Ragioniéri, Attilio. **Un bel problema per i biologi: Sulla comparsa dell' odore nei fiore delle "roselline di Firenze" (Ranunculus asiaticus var.).** [A good problem for biologists: On the appearance of odor in the flowers of the "Florentine roselline" (Ranunculus asiaticus).] Bull. R. Soc. Toscana Orticult. **44**: 87–94. 1919.—See Bot. Absts. 4, Entry 1832.

443. Rasmuson, Hans. **Genetische Untersuchungen in der Gattung Godetia.** [Genetical investigation within the genus Godetia.] Ber. Deutsch. Bot. Ges. **37**: 399–403. 1919.—A very condensed preliminary note about author's experiments with *Godetia Whitneyi* and *G. amoena*. Branching habit, leaf-characters, color, size, form and doubleness of the flowers, are analyzed.—*K. V. Ossian Dahlgren.*

444. Raum, J. **Ein weiterer Versuch über die Vererbung die Samenfarbe bei Rotklee.** [A further study on the inheritance of seed color in red clover.] Zeitschr. Pflanzenzücht. **7**: 148–155. Dec., 1919.

445. Rebel, H. **Ein neuer Tagfalterhybrid.** [A new butterfly hybrid.] Verhandl. K. u. K. Zool. Bot. Ges. Wien **68**: 273–276. 1918.

446. Richet, C., and H. Cardot. **Mutations brusques dans la formation d'une nouvelle race microbienne.** [Sudden mutations in the formation of a new race of microbes.] Compt. Rend. Acad. Sci. Paris **168**: 657–663. 1919.

447. Roberts, Herbert F. **A practical method for demonstrating the error of mean square.** School Sci. Math. **19**: 677-692. Nov., 1919.—This paper treats of the mean, the standard deviation and coefficient of variation with especial reference to practical methods of illustrating the error of the mean square to students of little training in mathematics.—*John W. Gowen.*

448. Roemer, Th. **Über Lupinenzüchtung.** [On Lupine breeding.] Deutsch. Landw. Presse **1919**: 174–175. 1919.—See Bot. Absts. 5, Entry 299.

449. Rother, W. **Phyllokakteen Kreuzungen.** [Phyllocactus crosses.] Monatsschr. Kakteenkunde **29**: 32–33. 1919.—Reciprocal crosses of *P. Wrayi* and *P. Vogelii* are described and differentiated.—*A. S. Hitchcock.*

450. Ružička, Vladislav. **Restitution und Vererbung. Experimenteller, kritischer und synthetischer Beitrag zur Frage des Determinationsproblems.** [Restitution and heredity. Experimental critical and synthetic contribution to the problem of determination.] Julius Springer: Berlin, 1920.

451. St. John, Harold. **Two color forms of Lobelia cardinalis L.** Rhodora **21**: 217–218. 1919.—Describes variation in color of flowers of *Lobelia cardinalis*. A form with rose-colored flowers, found in New Hampshire, is named *f. rosea*. One with white flowers was named *alba* by A. Eaton in 1836.—*T. D. A. Cockerell.*

452. Schindler, F. Bedeutung der Landrassen unserer Kulturpflanzen. [Significance of local varieties of our cultivated plants.] Deutsch. Landw. Presse 1918: 155. 1918.

453. Schmidt, Johs. La valeur de l'individu a titre de générateur, appréciée suivant la methode du croisement diallèle. [Individual potency appraised by the method of diallel crossing.] Compt. Rend. Trav. Lab. Carlsberg 14: 1–33. 1919.—See Bot. Absts. 5, Entry 302.

454. Schroeder. Entstehung und Vererbung von Missbildungen an der Hand eines Hypodaktylie-Stammbaumes. [Origin and inheritance of deformities in a hypodactylous pedigree.] Monatsschr. Geburtshilfe Gynäkologie 48: 210–222. *3 pl. 7 fig.* 1918.

455. Shamel, A. D. Performance records of avocados based on citrus experiments. California Citrograph 5: 68, 86–88. *1 fig.* Jan., 1920.—Description of methods recommended for obtaining records of yield and quality of fruit, hardiness, and other horticulturally important characteristics of avocado trees, as basis for selection of desirable types for propagation. Organization suggested similar to the "bud selection department" of the California Fruit Growers' Exchange, which last season sold 230,000 citrus buds taken from superior trees.—*H. B. Frost.*

456. Siegel, W. Das Recht des Gemüsezüchters. [The right of the vegetable breeder.] *8vo.* Frick: Wien. 1919.—See Bot. Absts. 5, Entry 304.

457. Siemens, H. W. Erbliche und nichterbliche Disposition. [Hereditary and nonhereditary disposition.] Berlin. Klin. Wochenschr. 56: 313–316. 1919.

458. Siemens, H. W. Über die Grundbegriffe der modernen Vererbungslehre. [On the fundamental concepts of modern genetics.] Münchener Med. Wochenschr. 65: 1402–1405. 1918.

459. Siemens, H. W. Was ist Rassenhygiene? [What is race hygiene?] Deutschlands Erneuerung 2: 280–282. 1918.

460. Smith, L. H. The life history and biology of the pink and green aphid (Macrosiphum solanifolii Ashmead). Virginia Truck Sta. Bull. 27: 27–79. *12 fig.* 1919.—Much variation among individuals is found with respect to size of parts, color and reticulation within well-known pink and green varieties. No inheritance of size variations has been noted. Strains that differ from one another have been obtained. Sexual forms are not usually produced in Virginia. Spring migrants are chiefly of green variety. Nineteen first-born and eight last-born generations were reared from May to November, and 34 first-born generations in a twelve-month period. Four molts occur. Average age at beginning of reproduction is eleven days, average number of young produced by viviparous female is 45 during lifetime averaging 31 days.—*A. Franklin Shull.*

461. Snell, K. Farbenänderung der Kartoffelblüte und Saatenanerkennung. [Color changes of the potato blossom and the recognition of varieties.] Der Kartoffelbau 1919: 1–3. 1919.—See Bot. Absts. 5, Entry 306.

462. Sommer, K. Über Kartoffelzüchtung und vergleichende anbauversuche mit Neuzüchtungen auf der Domäne Ellischau. [Potato breeding and comparative cultural tests of new varieties on the Ellischau estate.] Nachr. Deutsch. Landw. Ges. Österr. 1919: 190–193. 1919.—See Bot. Absts. 5, Entry 307.

463. Stahel, G. Eerste verslag over de werkzaamheden ten behoeve van de selectie van Koffie en Cacao. [First report on the effectiveness of selection in coffee and cacao.] Dept. Landbouw in Suriname (Paramaribo) Bull. 36. *23 p.* 1919.—See Bot. Absts. 5, Entry 308.

461. Steve, H. Über experimentell, durch veränderte äussere Bedingungen hervorgerufene Rückbildungsvorgänge am Eierstock des Haushuhnes (Gallus domesticus). [On degenerative processes in the ovary of domestic fowl produced experimentally by changed external conditions.] Arch. Entwicklungsmech. Organ. 44: 533–588. *10 fig.* Sept., 1918.—Laying fowls were removed from their normal quarters and placed in close confinement. After various intervals the birds were killed and the ovaries examined. In all cases egg production ceased. If the birds were well fed, production was not resumed. The large ova were not resorbed for several months, though degenerative changes took place in the nucleus, which extended to smaller and smaller ova, the longer the birds were kept. If, however, the birds were starved or kept on limited diet for a time, and then fed suitably, the large ova were quickly resorbed, the degenerative changes did not extend to the small ova, and production was resumed after a comparatively brief interval.—*H. D. Goodale.*

465. Stout, A. B. Further experimental studies on self-incompatibility in hermaphrodite plants. Jour. Genetics 9: 85–129. *Pl. 3–4.* Jan., 1920.—Two self-sterile plants of *Verbascum phoeniceum* were crossed. In F_1, 58 plants were self-sterile, 9 bore some seeds, and 2 were highly self-fertile. From a highly self-fertile plant of this species there were raised (in addition to 27 plants with contabescent anthers) 5 self-sterile plants, 2 plants with some seeds, and 5 highly self-fertile plants.—Sowings made from open-fertilized or commercial seeds of *Eschscholtzia californica*, *Nicotiana Forgetiana*, *Brassica pekinensis*, and *Raphanus sativus*, showed a majority of self-sterile, and a minority bearing few or many seeds. The descendants of each of two self-fertile plants of *Nicotiana Forgetiana* showed a majority of more or less self-fertile plants.—In *Cichorium intybus*, 10 plants were uniform as to self-fertility or self-sterility throughout the blooming period. Of the descendants of 3 self-fertile plants, 244 were self-sterile, and 107 bore some seeds. In the next selfed generation, 205 plants were self-sterile, and 266 self-fertile in various degrees.—It is concluded that self-sterility in some species is highly variable.—*John Belling.*

466. Sturtevant, A. H. Contributions to the genetics of Drosophila melanogaster. III. Inherited linkage variations in the second chromosome. Carnegie Inst. Washington Publ. 278: 305–341. Washington, D. C. 1919.—The data presented demonstrate two genes in second chromosome of *Drosophila melanogaster*, each of which, in females heterozygous for it, greatly decreases crossing-over in region in which it lies. Both genes were found in same female, in stock from Nova Scotia. C_{II}, located to left of black, makes star black=0, and black purple very small. C_{II^r}, located between purple and plexus, greatly reduces purple speck region. Homozygous C_{II} shows no effect on crossing-over; homozygous C_{II} not tested. No crossing-over in males, as always.—C_{III}, located in right end of third chromosome, greatly decreases crossing-over between spineless and rough when heterozygous, but increases it when homozygous. $C_{III,II}$, in third chromosome, when heterozygous decreases crossing-over in third chromosome, but increases purple curved region of second.—Mechanism of these effects is still unknown. Other linkage variations are caused by sex, age, temperature, and genetic factors. In all cases, linear order of genes is unchanged, and flies of same constitution, under like conditions, give consistent results. The methods and results are striking confirmation of chromosome view of heredity.—*C. R. Plunkett.*

467. Sturtevant, A. H. A new species closely resembling Drosophila melanogaster. Psyche 26: 153–155. *1 fig.* Dec., 1919.—Describes *Drosophila simulans*, new species that has hitherto been confused with *D. melanogaster*. New form is common and widely distributed. Specimens can be separated easily only by means of male genitalia. Female *melanogaster* × male *simulans* produces only daughters, unless the mother carries a Y-chromosome. The hybrids are all sterile.—*A. H. Sturtevant.*

468. Sturtivant, Grace. Registration of new varieties. Gard. Chron. 67: 73. Feb. 14, 1920.—Plant patents seem impossible in the United States; but the registration of new varieties is important. It is suggested that higher awards should be given for plants in gar-

dens than for those at exhibitions. The custom of bracketing the breeder's name after the name of the variety is spreading among *Iris* specialists. Parentage should be put on record.—*John Belling.*

469. Sumner, F. B. **Continuous and discontinuous variations and their inheritance in Peromyscus.** Amer. Nat. 52: 177–208. *12 fig.* April–May, 1918.—Discusses in this first paper structural and pigmental differences in the western deer mouse, *Peromyscus maniculatus* (Wagner) based on collections from four climatically different localities in California,—Eureka, Berkeley, LaJolla, and Victorville. Humidity and rainfall are in a descending, and mean annual temperature in an ascending, order for localities as given. Considers hair color including microscopical structure, skin color, length of body, tail, foot, and ear, and number of tail vertebrae, illustrating by histograms and ordinary graphs.—Finds for pigmentation, intensive and extensive, series is Eureka>Berkeley>LaJolla>Victorville. For tail length Eureka>LaJolla>Berkeley and Victorville. For number of caudal vertebrae, Eureka>LaJolla>Victorville. For foot length, Eureka>LaJolla, Berkeley and Victorville. Ear length LaJolla>Eureka and Victorville>Berkeley. General conclusions reserved for final paper.—*L. B. Walton.*

470. Tammes, T. **Die Flachsblüte.** [**The flower of flax.**] Recuéil Trav. Bot. Neérland. 15: 185–227. *22 fig.* 1918.—See Bot. Absts. 5, Entry 310.

471. Taylor, H. V. **The popularity and deterioration of potatoes.** Card. Chron. 67: 108. Feb. 28, 1920.—New potato varieties are usually lower in quality than old standard varieties but at the same time are more resistant to diseases and adverse conditions. With cultivation and propagation the qualities improve, but vigor and disease resistance decreases. These simultaneous changes are held responsible for the appearance of six varieties which have attained popularity and each after ten to fifteen years have been succeeded in turn by another new variety.—*J. L. Collins.*

472. Thellung, A. **Neure Wege and Ziele der botanischen Systematik erläutert am Beispiele unserer Getreidearten.** [**New methods and purposes of botanical taxonomy illustrated by examples of our cereal species.**] Naturw. Wochenschr. 17: 449–458. 465–474. *3 fig.* 1918.

473. Thellung, A. **Über geschlechtsbegrenzte Speziesmerkmale (zu dem Aufsatz von Brehm).** [**On sex-limited species characters (in response to von Brehm).**] Naturw. Wochenschr. 18: 144. 1919.

474. Thomas, Roger. **The improvement of "Tinnevellies" cotton.** Agric. Jour. India 14: 315–330. 1919.

475. Turesson, Göte. **The cause of plagiotropy in maritime shore plants.** Contributions from the plant ecology station, Hallands Väderö, No. 1. Lunds Universitets Årsskrift. N. F. 16^2: 1–33. *15 tables, 4 fig., 2 pl.* 1919.—The prostrate form of some shore plants is demonstrated to depend upon geotropism induced by brilliant sunlight ("photocliny"). In obscure light the geonegative reaction becomes predominant.—From one hereditary point of view it is interesting to find that the prostrate vegetation can be made up of two genetically different elements, viz., modificatory prostrate forms, and hereditary prostrate variations. Both forms are sometimes found within the same systematic species. *Atriplex latifolium*, *A. ratulum* and *Chenopodium album* have each a forma "*prostratum*," which is constantly plagiotropic; the main species are only plagiotropic in intense light and erect in ordinary light. When growing together on exposed beach it may be difficult to separate the two types, and cultivating of them becomes necessary. By self-fertilization the *prostratum* form of both the *Atriplex*-species is found to breed true to plagiotropy.—"The hereditary prostrate variations differ physiologically from the prostrate modifications in being more sensitive to light; they respond to conditions of illumination which leave the latter unaffected and in a vertical position." Author supposes that the prostrate races have come into existence by dropping out of "height"-determining factors.—*K. V. Ossian Dahlgren.*

476. Urban, J. Hochpolarisierende Rübe und ihre Nachkommenschaft. [High-polarizing beets and their progeny.] Zeitschr. Zucker Industr. Böhmen 42: 387-391. 1919.—See Bot. Absts. 5, Entry 312.

477. Vaerting, M. Die verschiedene Intensität der pathologischen Erblichkeit in ihrer Bedeutung für die Kriegsdegeneration. [Different intensity of pathological inheritance and its significance for war degenerations.] Der Frauenarzt. 1918.

478. van der Wolk, P. C. [German rev. of: van der Wolk, P. C. Onderzoekingen over blÿvende modificaties en hun betrekking tot mutaties. (Researches on permanent modifications and their relations to mutations.) Cultura 31: 82-105. *1 pl.* 1919. (See Bot. Absts. 3, Entry 296.)] Zeitschr. Pflanzenzücht. 7: 142-144. Dec., 1919.

479. Vernet, G. Biométrie et homogénéité. [Biometry and homogeneity.] Bull. Agric. Inst. Sci. Saigon 2: 15-26. 1920.

480. Vieillard, P. Note sur la sélection des riz par la constitution de lignées pures et sur les hybridations des riz. [Note on the selection of rice by establishment of pure lines and on the hybridization of rice.] Bull. Agric. Inst. Sci. Saigon 2: 11-15. 1920.

481. Vogt, A. Vererbung in der Augenheilkunde. [Heredity in ophthalmology.] Münchener Med. Wochenschr. 66: 1-5. 1919.

482. Volkart, A. 40. und 41. Jahresbericht. Schweizerische Samenuntersuchungs- und Versuchsanstalt in Oelikon-Zürich. [40th and 41st annual report. Swiss seed-control and experiment station in Oerlikon-Zürich.] Landw. Jahrb. Schweiz. 1919: 1-40. 1919.—See Bot. Absts. 5, Entry 313.]

483. von Bubnoff, Serge. Über einige grundlegende Prinzipien der paläontologischen Systematik. [Some fundamental principles of paleontological taxonomy.] Zeitschr. indukt. Abstamm. Vererb. 21: 158-168. Sept., 1919.—Wedekind was followed in his application of the statistical rules of variation to paleontological material. Two very common Triassic ammonites from one locality were studied in hundreds of specimens. A form had been separated from each and named as a species on account of a single and doubtful difference. When the variates were seriated, the supposed separate forms gave in each case a single typical variation curve along with the species. This shows that the difference in question was not sufficient to distinguish species, or even varieties; and races, or "elementary species," cannot be dealt with in paleontology.—A correlation between two or more characteristics was obtained by comparing different stages of growth, or by comparing closely allied species. Characteristics which are correlated in this fashion should vary together if the variation is genetic. They did not vary together in a trial of individuals of the same species. Hence this correlation is a test of specific difference.—*John Belling.*

484. von Caron-Eldingen. Physiologische Spaltungen ohne Mendelismus. [Physiological segregation without Mendelism.] Deutsch. Landw. Presse 1919: 515-516. 1919.—See Bot. Absts. 5, Entry 314.]

485. von Caron-Eldingen. Mutationen und Doppelkörner. [Mutations and double grains.] Deutsch. Landw. Presse 45: 618. *3 fig.* 1918.

486. von Caron-Eldingen. Physiologische Spaltungen oder vegetative Mutation (Meinungsaustausch). [Physiological splitting or vegetative mutations.] Deutsch. Landw. Presse 46: 56. 1919.

487. von Graevenitz, Luise. Ein merkwürdiges Resultat bei Inzuchtsversuchen. [A remarkable result in an inbreeding experiment.] Zeitschr. indukt. Abstamm. Vererb. 21: 169-173. Sept., 1919.—Effects of four different types of pollination compared on the off-

spring of three plants, *Petunia*, *Digitalis* and *Oenothera*. Flowers of individual plants treated with pollen from following sources: (1) from the same flower, (2) from other flowers on the same plant, (3) from a sister plant, (4) from a plant of a different strain. In all but the first the flowers were castrated. For (1) and (2) the same lot of pollen was used and applied at the same time. Fifty-two plants of *Petunia* were pollinated in this way and the progenies of each, numbering at least 50 individuals in each class, were weighed. The results show that in 37 cases the (2)-pollinated plants were heavier than (1) while in 15 cases the reverse holds. The other two types of pollination resulted in still heavier plants on the average according to the dissimilarity of the parents. Four plants of *Digitalis* treated in like manner show the same result, the cross-pollination between different flowers of the same plant give heavier offspring than self-pollination within the individual flower. *Oenothera* gave no differences. *Antirrhinum*, although not fully investigated, shows a difference between the pollinations. Author is unable to find any circumstances which might account for these effects and considers them to be biologically not understandable.—*D. F. Jones.*

488. von Oettingen. **Die Vererbung erworbener Eigenschaften (aus dem Werke der Pferdenzucht von Oberlandstallmeister von Oettingen). [The inheritance of acquired characters (from the work in horse-breeding by von Oettingen).]** Deutsch. Landw. Tierzucht. **23**: 7. 1919.

489. von Ryx, G. **Ein neues Beispiel einer Knospenmutation bei den Kartoffeln. [A new example of bud mutation in potatoes.]** Deutsch. Landw. Presse **2**. *1 fig.* 1918.

490. von Tschermak, A. **Der gegenwärtige Stand des Mendelismus und die Lehre von der Schwächung der Erbanlagen durch Bastardierung. [The present status of Mendelism and the doctrine of the weakening of hereditary units through hybridization.]** Naturw. Wochenschr. **17**: 509–611. 1918.

491. von Tschermak, Erich. **Über Züchtung landwirtschaftlich und gärtnerisch wichtiger Hülsenfrüchter. [Breeding of agriculturally and horticulturally important legumes.]** Arb. Deutsch. Landw. Ges. **1919**: 80–106. 1919.

492. von Tschermak, Erich. **Bastardierungsversuche mit der grünsamigen Chevrier-Bohne. [Hybridization studies with the green-seeded Chevrier bean.]** Zeitschr. Pflanzenzücht. **7**: 57–61. June, 1919.

493. von Tschermak, E. **Beobachtungen bei Bastardierung zwischen Kulturhafer und Wildhafer. [Observations on hybridizations between cultivated oats and wild oats.]** Zeitschr. Pflanzenzücht. **6**: 207–209. 1918.

494. von Tschermak, E. **Beobachtungen über anscheinende vegetative Spaltungen an Bastarden und über anscheinende Spätspaltungen von Bastardnachkommen speziell Auftreten von Pigmentierungen an sonst pigmentlosen Deszendenten. [Observations on apparent vegetative splitting in hybrid offspring, especially the occurrence of pigmentation on otherwise pigmentless descendants.]** Zeitschr. indukt. Abstamm. Vererb. **21**: 216–232. *1 fig.* Nov., 1920.

495. von Ubisch, G. **Gerstenkreuzungen. [Barley crosses.]** Landw. Jahrb. **53**: 191–244. *3 pl., 23 fig.* 1919.—See Bot. Absts. 5, Entry 315.

496. Waller, A. E. **Xenia.** School Sci. Math. **19**: 150–157. Feb., 1919.—Popular account of xenia to which nothing new is added.—See also Bot. Absts. 5, Entry 115.—*J. H. Kempton.*

497. Walter, F. K. **Über "familiäre Idiotie." [On familial idiocy.]** Zeitschr. ges. Neur. u. Psych. **40**. 1918.

498. Webber, Herbert John. **Selection of stocks in citrus propagation.** California Agric. Exp. Sta. [Berkeley] Bull. 317: 267–301. *4 tables, 14 fig.* Jan., 1920.—The individual trees in citrus orchards are always markedly variable in yield, doubtless partly because of variation in the stocks used in budding. Sweet orange and sour orange are principal citrus stocks in California. Seeds of each species have usually been collected indiscriminately; seedlings are always highly variable, yet few are usually discarded in nursery.—Tests at Citrus Experiment Station showed that large, intermediate and small nursery trees of three standard Citrus varieties retained their original size rank after two years in orchard, though selected in nursery budded from "performance-record" trees, where many of smaller stocks had been discarded at transplanting and some also at budding. Sweet-orange and sour-orange seedlings selected in nursery rows for variation in leaf form, habit, etc., and budded on sour-orange stocks in duplicate, indicate presence of numerous genetic types, some undesirable, among ordinary nursery stocks. Measurements in nursery of sour-orange stocks sorted at transplanting showed great variation, with much greater average size from the seedlings originally larger.—Possible factors in stock variation discussed. Probably seedlings small because of small embryos in polyembryonic seeds, crowding in seed bed, etc., as well as those genetically weak, are undesirable as stocks. Recommendations include: (1) planting of seeds from trees budded to selected good stock varieties, (2) rigorous elimination of small seedlings at transplanting and budding, and of small budded trees when ready for orchard planting.—*H. B. Frost.*

499. Weibull, C. G. **Weibullsholm 1870–1920, en återblick.** [**Weibullsholm 1870–1920, a retrospective review.**] *18 p., 11 fig.* W. Weibulls Illustrerade Årsbok (Landskrona) 15 (1920). 1919.—Account of the evolution and working methods of Weibull's station for plant improvement.—*K. V. Ossian Dahlgren.*

500. Weingart, W. **Künstliche Befruchtung von Kakteen.** [**Artificial fertilization of cacti.**] Monatsschr. Kakteenkunde 29: 106–107. 1919.—The author gives the results of self and cross pollination of several cactuses, mostly species of *Cereus.*—*A. S. Hitchcock.*

501. Wolff, Friedrich. **Ein Fall dominanter Vererbung von Syndaktylie.** [**A case of dominant inheritance of syndactyly.**] Arch. Rassen u. Gesellschaftsbiol. 13: 74–75. 1918.—One man in a family of five was syndactyl. Both of his parents, his sister and his three brothers were normal, and there seems to have been no previous history of syndactyly in this family. Married to a normal woman, he had seven children, all syndactyl. Each of these has married a normal individual and the combined number of grandchildren is now eighteen, of whom eight are syndactyl. In this family the syndactyly is somewhat more marked in males.—*C. H. Danforth.*

502. Yampolsky, Cecil. **The occurrence and inheritance of sex intergradation in plants.** Amer. Jour. Bot. 7: 21–38. Jan., 1920.—A general discussion of sex intergrades based on the author's studies of *Mercurialis annua*, on various other studies of sex-intergrades and sex polymorphism in plants and in animals, and on a survey of data on sex forms in orders of seed plants as given in Engler and Gilg's "Syllabus der Pflanzenfamilien."—In the monocots, 10 out of 11 orders representing 22 families have hermaphroditic, monoecious, dioecious and polygamous individuals, and in dicots 31 of the 40 orders including 90 families have certain representatives with two or more of the various types of sex. This distribution, shown in tables for orders and families (not for species) reveals that "practically every order has families which contain forms that show more than one kind of distribution of sex elements." The various terms used in describing sex conditions in plants are defined and species illustrating them are cited. It is pointed out that the obvious facts of sex distribution in plants, together with the results of experimental studies of heredity in polygamous or intersexual forms support the doctrine of varying sex potencies in germ cells rather than a sex-determination based on segregation of fixed unit factors.—*A. B. Stout.*

503. Ylppo. **Über das familiäre Vorkommen von Icterus neonatorum gravis.** [On familial occurrence of Icterus neonatorum gravis.] Münchener Med. Wochenschr. 65: 98. 1918.

504. Zander, L. **Der Einfluss der Bastardierung auf die Honigbildung.** [The influence of hybridization on honey formation.] Zeitschr. Angew. Entomol. 5: 88–93. 1918.

505. Ziegler, H. E. **Zuchtwahlversuche an Ratten.** [Selection experiments on rats.] Festschr. 100-jähr. Best. Kgl. Württ. Landw. Hochschule Hohenheim 1919: 385–399. 1919.

HORTICULTURE

J. H. Gourley, *Editor*

FRUITS AND GENERAL HORTICULTURE

506. Condit, I. J. **The Kaki or oriental persimmon.** California Agric. Exp. Sta. Bull. 316: 231–266. *20 fig.* 1919.—A discussion is given of the history of the persimmon, *Diospyros, Spp.*, its introduction into the United States and the botany of the reproductive parts. Different varieties of the Oriental species of persimmon, *Diospyros kaki*, are discussed at length from the standpoint of their morphology, astringency, soil requirements, methods of propagation and care of the trees, and methods of harvesting, processing and marketing the fruit. A table of analysis of different varieties of persimmons is given and a brief discussion of the insect enemies and diseases.—*W. P. Kelley.*

507. Detjen, L. R. **The limits in hybridization of Vitis rotundifolia with related species and genera.** North Carolina Agric. Exp. Sta. Tech. Bull. 17. *25 p.* 1919.—See Bot. Absts. 4, Entry 562.

508. Gardner, V. R. **Pruning the apple.** Missouri Agric. Exp. Sta. Circ. 90. *20 p. 11 fig.* 1920.

509. Hendrickson, A. H. **Plum pollination.** California Agric. Exp. Sta. Bull. 310. *28 p. 5 fig.* 1919.—A considerable number of varieties of two different species of plums are grown commercially in California, namely, the Japanese, *Prunus triflora*, and the European, *P. domestica.* Of the seventeen varieties studied all except four are self-sterile. No evidence of inter-sterility between different varieties was noted, but certain varieties are more effective pollinators than others. Comparative study of different orchards indicated that the common honey bee is an effective agent in promoting cross-fertilization between the different varieties of plums.—*W. P. Kelley.*

510. Shaw, P. J. **Fourteenth Annual Report of the Nova Scotia Agricultural College and Farm. Part 5.—Report of the Professor of Horticulture.** Prov. of Nova Scotia Ann. Rept. Sec. for Agric. 1918: 75–100. 1919.

511. Sheward, T. **Fruit trees in pots for winter forcing.** Gard. Chron. Amer. 23: 360. *1 fig.* 1919.

512. Smith, Arthur. **A lesson on fall preparation of the ground for spring planting.** Gard. Chron. Amer. 23: 341–343. 1919.

513. Truelle, A. **La situation des terrains a-t-elle de l'influence sur la richesse saccharine des pommes a cidre? [Has the location of the soil an influence on the sugar content of cider apples?]** Ann. Sci. Agron. Francaise et Etrangère 36: 107–116. 1919.—Pomologists have always held that the soil and exposure are among the most important factors affecting the chemical composition of cider fruits. Some data are published in which are given the density at 15° and total sugar expressed as grams of fermentable glucose. Twelve varieties of apples were studied but only the most commercially important six are reported on. The data are

grouped and considered under the headings of (1) those for trees grown on slopes and plateaus and (2) those for trees grown in valleys, a comparison being made for each variety grown in the two situations. The results show considerable variation in the sugar content, there being greater variation among those grown in the valleys. According to the author the following points are indicated by the results at hand: (1) The topographic position exercises an influence upon the production of sugar in certain varieties of cider apples. (2) The effect of the location on the sugar content is not uniform. In some varieties it is greater when grown on the higher elevations and with others it is greater when they are grown in valleys. (3) The differences in the weights of sugar in the juice from the apples grown on the uplands and in the valleys vary from 1 to 10.88 grams per liter. (4) The effect of topography on the sugar content of cider apples is generally feeble. The effect of topography is less than that of variety, which depends mainly on the composition of the soil.—*A. B. Beaumont.*

514. Tufts, Warren P. **Pollination of the Bartlett pear.** California Agric. Exp. Sta. Bull. 307: 369–390. *8 fig.* 1919.—The majority of the varieties of pears grown in California bloom for comparatively brief periods only, but all of them produce an abundance of pollen. Artificial pollination experiments showed that Bartlett pears are partially self-sterile when grown in certain localities and wholly so in others. All the other commercial varieties are capable of cross fertilizing the Bartlett variety. It was noted that the fruit resulting from cross-fertilization with pollen from a different variety tended to drop less freely in June than was the case with self-fertilized fruits. It is recommended that other varieties of pears be planted intermittently throughout an orchard of Bartlett pears as a means of promoting cross-fertilization. [See Bot. Absts. 4, Entry 798.]—*W. P. Kelley.*

515. Tufts, Warren P. **Almond pollination.** California Agric. Exp. Sta. Bull. 306: 337–366. *15 fig.* 1919.—It is shown that all the common varieties of almonds grown in California are self-sterile to a large extent and certain of them are inter-sterile. The different varieties may be roughly divided into two classes on the basis of the time of blooming, and considerable differences were noted in the amounts of pollen produced by the different varieties. Experiments demonstrated that cross-pollination can be effected between certain varieties very readily whereas other varieties are inter-sterile. It is shown that mixed planting of inter-fertile varieties in the same orchard results in increased yields of fruit. The inter-pollinating relationships of the different varieties are shown tabularly. The effects of meteorological conditions and insects on pollination are briefly discussed. The common honey bee is though to be the best pollinating agent. [See Bot. Absts. 4, Entry 797.]—*W. P. Kelley.*

FLORICULTURE AND ORNAMENTAL HORTICULTURE

516. Acosta, Celsa. **Sobre el cayeput.** [The cajuput.] Revist. Agric. Com. y Trab. 2: 535–537. *3 fig.* 1919.—Description of cajuput tree (*Melaleuca leucadendron* Linn.) and its uses.—*F. M. Blodgett.*

517. Arango, Rodolfo. **La palma real, su belleza ornamental y utilidad práctica.** [The royal palm as an ornamental and useful plant.] Revist. Agric. Com. y Trab. 2: 557–559. *2 fig.* 1919.

518. Baxter, Samuel Newman. **How nurserymen may best compete for the Christmas tree market.** Florists' Exchange 49: 133. 1920.—Ordinary nursery ground is too valuable for growing large Christmas trees; but small trees are gaining in favor with dwellers in small apartments and can be profitably grown. Nursery-grown, bushy stock is more attractive than the wild, the supply of which may soon become exhausted or unavailable. The 1- to 2-foot size could be offered in 6- or 8-inch pots, and the 2- to 4-foot size in larger pots or tubs, both at reasonable prices. Frequent transplanting is unnecessary; thinning of plants in the nursery row and shearing will assist in making bushy specimens. Figures are given of expected yield per acre over a ten-year period.—*L. A. Minns.*

519. Esler, John G. **A rhododendron king.** Florists' Exchange 49: 169. 1920.—Mr. W. K. Labar for the past fifteen years has collected native rhododendrons all over the Blue Ridge from Pennsylvania to North Carolina, selling them, as well as azaleas, kalmias and leucothoës, to parks, cemeteries and nurserymen. He has secured about 100 acres of wooded hillside with northern exposure, and will specialize in the above mentioned plants and others of similar nature. He is planting some of these by the thousand, using small collected plants and seedlings.—*L. A. Minns.*

520. Gibson, Addison H. **The poinsettia.** Gard. Chron. Amer. 23: 366. 1919.

521. Gibson, H. **Hardy shrubs that can be forced.** Gard. Chron. Amer. 23: 335, 336. 1919.

522. Gibson, Henry. **Forcing herbaceous plants and bulbs for winter flowers.** Gard. Chron. Amer. 23: 359. 1919.

523. Griffiths, David. **Producing domestic Easter lilies.** Florists' Exchange 49: 134. 1920.—Notes on growing Easter lilies up to the present are added to Griffith's article in Florists' Exchange 48: 775. 1919. Nine batches of bulbs now in the greenhouses of the Bureau of Plant Industry, Department of Agriculture, Washington, D. C., are mentioned, all of which promise interesting data in this investigational work. It is suggested that each grower of Easter lilies might advantageously do a little experimental work for himself.—*L. A. Minns.*

524. Hammond, Bertha B. **Forcing hyacinths for winter bloom.** Gard. Chron. Amer. 23: 337, 338. *Fig. 1–6.* 1919.

525. Holzhausen, Axel. **Laeliocattleya suecica nov. hybr.** Svensk. Bot. Tidskr. [Stockholm] 13: 97–99. 1919.

526. Matthews, Edwin. **Transplanting a mammoth yew tree in winter.** Florists' Exchange 49: 83. *1 fig.* 1920.—An English yew, 25 feet in height, 30 feet in circumference, about 80 years old, and weighing, with the ball of soil attached, approximately 5 tons was moved about one-half mile at Beverly, New Jersey, in January, 1918, and reset on the grounds of the owner. It was raised out of its former situation by means of rollers and windlass, raised onto a strong dray wagon by means of jack-screws, and drawn to its destination by six horses. Adverse conditions made the task formidable, but subsequent good care makes the removal appear to be successful up to the present.—*L. A. Minns.*

527. Moore, Henry I. **Descriptive list of hardy and semi-hardy primulas.** Gard. Chron. Amer. 24: 401, 402. 1920.

528. Moore, Henry I. **The city rose garden.** Gard. Chron. Amer. 23: 361. 1919.

529. Pleas, Sarah A. **A plea for seedling peonies.** Flower Grower 6: 123, 124. *1 fig.* 1919.

530. Rothe, Richard. **Landscape possibilities with brook and natural stream.** Gard. Chron. Amer. 23: 393, 394. *4 fig.* 1920.

531. Sakamoto, Kiyoshi. **The Japanese garden and how to construct it.** Florists' Exchange 49: 61, 63, 138. *9 fig.* 1920.—A Japanese garden must be made to appear as if it were a piece of natural scenery. The noblest sentiment evoked comes from the correct placing of each object—cottage, tree, herb or stone. Only large gardens can be successfully arranged to present different aspects according to season. An ordinary garden may better be made to appear much the same the year round. Evergreens are the foundation planting, set off by deciduous trees. The main types of garden are described: (1) the plain-garden, reproducing a plain, usually of considerable extent, good examples of which are the Tokiwa Garden and

the gardens of the Imperial Shrines of Ise; (2) the cypress garden, which may be small, only a section cut apart from a larger garden and representing a forest scene in miniature; and (3) the thicket garden, small, seeming to lead one to a dense wood beyond.—*L. A. Minns.*

532. Saunders, A. P. **American Iris Society.** Florists' Exchange 49: 285. 1920.—The meeting for the formation of the American Iris Society was held at the Museum Building of the New York Botanical Garden, Bronx Park, New York, on January 29, 1920. Sixty persons were present, among whom were many of the trade, and amateur Iris specialists. Dr. N. L. Britton, Director of the New York Botanical Garden, delivered the opening address. He told of the Iris garden begun in the New York Botanical Garden, and invited members of the newly-formed Iris Society to make free use of the library of the Botanical Garden.—The work of the Iris Society has been carefully planned. There will be test and exhibition gardens established, Iris shows with suitable prizes, and investigations made in history, classification of garden varieties, culture and pests of the Iris. A constitution was approved and officers elected of whom John C. Wister of Philadelphia is president, and R. S. Sturtevant of Wellesley, Massachusetts, is secretary.—*L. A. Minns.*

533. Smith, Arthur. **The care and culture of house plants.** Gard. Chron. Amer. 23: 372–375. 1919.

534. Smith, Arthur. **Putting the garden to bed for the winter.** Gard. Chron. Amer. 23: 368–371. 1919.

535. White, E. A. **Hubbard Gold Medal awarded to rose "Columbia."** Florists' Exchange 49: 171. 1920.—The Executive Committee of the American Rose Society has recently voted to award to the hybrid tea rose Columbia, registered in 1917 by E. G. Hill, of Richmond, Indiana, the Gertrude M. Hubbard Gold Medal for the best rose of American origin introduced during the last five years. This medal, the highest honor the American Rose Society can confer on a hybridizer, has been bestowed but once; in 1914 it was given to M. H. Walsh of Woods Hole, Massachusetts, for the introduction of the climbing rose "Excelsa."—*L. A. Minns.*

VEGETABLE CULTURE

536. Olmstead, W. H. **Availability of carbohydrate in certain vegetables.** Jour. Biol. Chem. 41: 45–58. 1920.—The amount of carbohydrate available to the body from certain vegetables, usually used in low carbohydrate diets for diabetic patients, was determined (1) by the use of diastase and copper reduction, (2) by feeding to phloridinized dogs. The results by these two methods were—cabbage (1) 4.4 per cent, (2) 5.0 per cent, cauliflower (1) 2.8 per cent, (2) 3.4 per cent, spinach (2) 1.2 per cent, lettuce (1) 1.0 per cent. The amount in cabbage was reduced about 90 per cent by thrice cooking.—*G. B. Rigg.*

537. Tracy, W. W. **Growing tomato seed.** Seed World 7[3]: 18–19. 1920.

538. Work, P. **Vegetable gardening on eastern muck soil.** Jour. Amer. Peat Soc. 13: 27–36. 1920.—Muck soils have proved to be preeminently adapted for the production of onions, celery and summer lettuce and they are well suited for several other crops.—*G. B. Rigg.*

539. Zimmerman, H. E. **Tomato grafted on potato.** Amer. Bot. 25: 144. *1 fig.* 1919.

HORTICULTURE PRODUCTS

540. Baughman, Walter F., and George S. Jamieson. **The composition of Hubbard squash seed oil.** Jour. Amer. Chem. Soc. 42: 152–157. 1920.

541. Haynes, Dorothy, and Hilda Mary Judd. **The effect of methods of extraction on the composition of expressed apple juice, and a determination of the sampling error of such**

juices. Biochem. Jour. 13: 272–277. 1919.—The following points were taken up: (1) does rapid freezing by liquid air produce any alteration in character of the sample, (2) does freezing render tissues freely permeable to all those constituents of the cell sap present in expressed juice, (3) the probable error due to individual variability in apples used. Comparisons were made of P_H values, freezing points, time and fall of viscometer, conductivity, acidity, and determination of sugars. No real difference was found between liquid air and freezing mixture method. Tissues were freely permeable to acids and sugars but colloids were held back as indicated by changing viscosity. Samples varied greatly resulting in a large probable error. Authors conclude that neglect of sampling errors in previous work of this nature vitiates much data.—*A. R. Davis.*

542. Jamieson, George S., and Walter F. Baughman. Okra seed oil. Jour. Amer. Chem. Soc. 42: 166–170. 1920.

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. Sinnott, *Editor*

543. Baccarini, P. **Notule teratologiche.** [Teratological notes.] Nuovo Gior. Bot. Ital. 25: 225–247. 1918.—Abnormalities in flower development and morphology were noticed among members of diverse plant groups: *Delphinium Ajacis, Brassica Rapa, Isatis tinctoria, Viburnum Sandankwa, Dahlia variabilis, Cypripedium* sp., *Carlina vulgaris* and *Anchusa italica.* The abnormalities consist in depression, entire disappearance or malformation of floral parts, notably the essential parts of the flower. In some cases, for example in *Delphinium Ajacis*, the reduction in the number of carpels suggests the reappearance of characters found at present in the Staphysagria group.—*Ernst Artschwager.*

544. Bassler, Harvey. A sporangiophoric lepidophyte from the Carboniferous. Bot. Gaz. 68: 73–108. Aug., 1919.—See Bot. Absts. 3, Entry 1597.

545. Bexon, Dorothy. **Observations on the anatomy of teratological seedlings. II. On the anatomy of some polycotylous seedlings of Centranthus ruber.** Ann. Botany 34: 81–94. *9 fig.* 1920.—The vascular anatomy of seedlings of *Centranthus ruber* showing all degrees of polycotyly from very incomplete tricotyly to complete tetracotyly is described. The hemitricotylous material is divisible into three groups: (a) Two bundles, one from each half of the incompletely split cotyledon, approach and fuse at various levels to form one pole of the diarch root, the other pole being formed by the bundle from the other cotyledon. (b) The two bundles remain distinct for a distance in the hypocotyl forming with the bundle from the other cotyledon a triarch condition, which eventually becomes reduced to diarchy by the fusion of the two bundles from the same cotyledon. (c) One bundle from the split cotyledon fails to rotate, retains its collateral structure and finally disappears. In the tricotyls a triarch condition is usually established, and becomes reduced to the diarch condition either by the disappearance of one arm or by the fusion of the two. The hemitetracotyls and tetracotyls for the most part show conditions like those described under (a) and (b) above with the modifications resulting from the splitting of both original cotyledons instead of one. One hemitetracotyl showed double structure throughout and evidently represented a twinned condition. It is suggested that the twinning may be due either to the fusion of distinct embryos or to the partial separation of the daughter cells resulting from the division of the embryo initial.—*W. P. Thompson.*

546. Bobilioff, W. **De inwendige bouw der schorselementen ven Hevea Brasiliensis.** [The structure of cell elements in the bark of Hevea Brasiliensis.] Arch. Rubbercult. Nederlandsch-Indië 3: 222–231. 1919.—Paper deals principally with the structure of the laticiferous vessels of *Hevea* and their cytology in connection with the physiological significance of latex.

The author points out that protoplasm and nuclei occur in the laticiferous vessels, but that the nuclei are larger than those of other cortex cells. Both nuclei and vacuoles occur in the protoplasm where they can be seen after the caoutchouc has been dissolved out. Therefore the latex of *Hevea* is probably cell-sap, which generally occurs in the vacuoles of the laticiferous vessels. Sometimes many of the nuclei of laticiferous vessels unite in one place, hence it seems that the nuclei have the faculty of moving. Author also observes that the nuclei pass from one vessel into another through the wall openings.—*W. E. Cake.*

547. Bürgerstein, A. **Beiträge zur Naturgeschichte der Scoglien und Kleineren Inseln Süddalmatiens. 8. Anatomische Beschreibung des Holzes einiger Sträucher und Halbsträucher.** [The natural history of the smaller islands of southern Dalmatia. 8. Anatomical description of the wood of some shrubs and undershrubs.] Denkschr. K. Akad. Wiss. Wien. (Math.-Nat. Kl.) **92**: 329–334. 1916.

548. Chirtoiü, Marie. **Remarques sur le Symplocos Klotzschii et les affinités des Symplocacées.** [Remarks on Symplocos Klotzschii and the affinities of the Symplocaceae.] Bull. Soc. Bot. Genève **10**: 350–361. *5 fig.* 1918.

549. Chirtoiü, Marie. **Observations sur les Lacistéme et la situation systematique de ce genre.** [Observations on the species of Lacistema and the systematic position of this genus.] Bull. Soc. Bot. Genève **10**: 317–349. *18 fig.* 1918.

550. Clute, Willard N. **Peloria.** Amer. Bot. **25**: 148. 1919.

551. Coulter, J. M. **Perennating fruit of Cactaceae.** [Rev. of: Johnson, Duncan S. The fruit of Opuntia fulgida. A study of perennation and proliferation in the fruits of certain Cactaceae. Carnegie Inst. Publ. 269. *62 p., 12 pl.* 1918.] Bot. Gaz. **68**: 151. 1919.

552. Coulter, J. M. **Root-nodules.** [Rev. of: Spratt, Ethel R. A comparative account of the root-nodules of the Leguminosae. Ann. Botany 33: 189–199. *5 fig.* 1919. (See Bot. Absts. 3, Entry 1139.)] Bot. Gaz. **68**: 311. 1919.

553. Coulter, J. M. **Suspensor of trapa.** [Rev. of: Tison, A. **Sur le suspenseur du Trapa natans L.** Rev. Gén. Bot. 31: 219–228. *5 fig.* 1919. (See Bot. Absts. 3, Entry 2451.)] Bot. Gaz. **68**: 312. 1919.

554. Cremata, Merlino. **Un fenomeno curioso.** [A curiosity.] Revist. Agric. Com. y Trab. 2: 509. *2 fig.* 1919.—Several cases are cited where the royal palm has become branched. —*F. M. Blodgett.*

555. Dixon, Henry H. **Mahogany and the recognition of some of the different kinds by their microscopic characters.** Sci. Proc. Roy. Soc. London **15**: 431–486. 22 *pl.* 1918.

556. Eberstaller, Robert. **Beiträge zur Vergleichenden Anatomie der Narcisseae.** [Comparative anatomy of Narcissus.] Denkschr. K. Akad. Wiss. Wien. (Math.-Nat. Kl.) **92**: 87–105. *3 pl.* 1916.

557. Esmarch. **Über den Wundverschluss bei geschnittenen Saatkartoffeln.** [Wound healing in cut seed potatoes.] Fühl. Landw. Zeit. **67**: 253–256. 1918.—True periderm formation on the exposed surfaces of cut seed potatoes takes place only, and most rapidly, when the tubers are kept in a fairly moist place. The practice of leaving the cut tubers to dry in the air results only in the drying in of the upper cell layers which may be accompanied by a suberization of the walls. It is questionable whether a crust formed in such a way affords real protection against parasitic bacteria and fungi.—*Ernst Artschwager.*

558. Gertz, Otto. **Proliferation av Honhänge hos Alnus glutinosa (L.) I. Gaertn.** [Proliferation of the female catkins of Alnus glutinosa.] (Résumé and legends of illustrations in German.) Svensk. Bot. Tidskr. [Stockholm] 13: 71–74. 1919.—Author describes and illustrates a case of proliferated female catkins in *Alnus glutinosa* not heretofore reported in literature.—*W. W. Gilbert.*

559 Grier, N. M. **Note on proliferative power of Pinus sp.** Ohio Jour. Sci. 20: 21–23. 1919.

560. Groves, James. **Sex-terms for plants.** Jour. Botany 58: 55–56. 1920.—A brief note continuing the discussion of the terminology of plants begun in Jour. Botany 57. The codification of botanical terminology is very necessary. Authors are now constantly inventing new terms and piling up a mass of terminology which cannot but retard and embarrass future workers. This problem should be dealt with in future meetings of the International Botanical Congress.—*K. M. Wiegand.*

561. Hawtrey, S. H. C. **Notes on a few useful plants and home industries of Paraguay.** South African Jour. Indust. 3: 35–41. 1920.

562. Hill, J. Ben. **Anatomy of Lycopodium reflexum.** Bot. Gaz. 68: 226–231. *5 fig.* 1919.—The chief points of interest are the presence of typical cortical roots and the various "types" of stele in the stem. The development and differentiation of the tissues in the steles of the cortical roots parallel those in the stele of the stem. The xylem arrangement may be radial, parallel-banded, or radial so modified as to consist of an inner cylinder of xylem inclosing a small strand of phloem, the last being most frequent. The author's previous suggestion that in *Lycopodium* all xylem arrangements may occur in the same stem is confirmed.—*H. C. Cowles.*

563. Hirscht, Karl. **Verschlossenblütige Pflanzen im Zimmergarten.** [Cleistogamous flowers in a window garden.] Monatsschr. Kakteenkunde 29: 103–104. 1919.—The cleistogamous flowers of *Anacampseros filamentosa* Sims. are described.—*A. S. Hitchcock.*

564. Jauch, Berthe. **Quelques points de l'anatomie et de la biologie des Polygalacées.** [Certain details of the anatomy and biology of Polygalaceae.] Bull. Soc. Bot. Genève 10: 47–84. *15 fig.* 1918.

565. Jauffret, Aime. **La détermination des bois de deux Dalbergia de Madagascar, d'après les caractères de leurs matiéres colorantes.** [Identification of wood of Dalbergia by staining reactions.] Compt. Rend. Acad. Sci. Paris 168: 693–694. 1919.—The wood of two species of *Dalbergia* from Madagascar showed very characteristic specific reactions when treated with alcohol, sulphuric acid, caustic soda, ammonia, iron perchloride, bisulphite of soda, ether, chloroform, and benzene. The alcoholic solution of the powdered wood of each species also gave a characteristic spectrum. Such characters offer a basis for the identification of species in the absence of other parts of the plant.—*F. B. Wann.*

566. Johansson, K. **Fyllomorfi och diafys hos Geranium pyrenaicum L.** [Phyllomorphy and diaphysis of Geranium pyrenaicum L.] Svensk. Bot. Tidskr. [Stockholm] 13: 99. 1919. —A brief description of cases of phyllomorphy and diaphysis in *Geranium pyrenaicum* is given and references made to cases of teratology in other species of *Geranium.*—*W. W. Gilbert.*

567. Kondo, M. **Ueber die in der Landwirtschaft Japans gebrauchten Samen.** [Seeds used in Japanese agriculture.] Ber. Ohara Inst. Landw. Forsch. 1: 261–324. *17 fig.* 1918.—See Bot. Absts. 5, Entry 37.

568. McMurray, Nell. **The day flower.** Amer. Bot. 25: 150. 1919.—The flower of *Commelina communis* is described.—*W. N. Clute.*

569. Miller, E. C. **Development of the pistillate spikelet and fertilization in Zea mays L.** Jour. Agric. Res. 18: 255–265. *Pl. 19–32.* 1919.—Study made on three varieties of maize: Pride of Saline, Freed White Dent, and Sherrod White Dent. The development of the pistillate spikelet is briefly described.—In the development of the embryo sac there is no degeneration of megaspores; the megasporocyte nucleus by three divisions gives rise to the eight nuclei of the sac, as in *Lilium*. The antipodals multiply and form a tissue of from 24 to 36 cells in the base of the sac.—The silk is receptive to pollen not only at the stigmatic surface, but also along the greater portion of its length. The pollen tube may penetrate the silk at once or grow along the surface for some distance and penetrate later. Around the two vascular bundles of the silk are sheaths of cells with rich contents; it is between these cells that the tube grows. The tube penetrates into the embryo sac and liberates the two male nuclei, which are formed before the shedding of the pollen grain. One of them fuses with the egg nucleus, while the other unites with the two polar nuclei, which do not fuse until this time. About 26 to 28 hours elapse between pollination and fertilization.—The endosperm develops rapidly, filling the sac with tissue in 36 hours; the embryo by this time has 14 to 16 cells. [See Bot. Absts. 4, Entry 679.]—*L. W. Sharp.*

570. Miller, Ward L. **Polyxylic stem of Cycas media.** Bot. Gaz. 68: 208–221. *11 fig.* 1919.—The normal cylinder begins its differentiation as high up as the meristem, the others beginning theirs successively lower, and each one in the cortex outside the next inner cylinder. Protoxylem and protophloem are developed during the early activities of the normal cylinder, the protoxylem elements usually being scalariform, as in the primary xylem. The secondary xylem is characteristically pitted. In the first cortical cylinder most of the xylem elements are pitted, neither protoxylem nor protophloem being observed. In both cylinders there is a relatively large number of suberized bast fibers. All cortical cylinders are similar in origin and development, and probably are related in appearance to alternating periods of rest and activity.—*H. C. Cowles.*

571. Morvillez, F. **L'appareil conducteur foliaire des Legumineuses: Papilionacées et Mimosées.** [Leaf traces in the Leguminosae: Papilionatae and Mimosoideae.] Compt. Rend. Acad. Sci. Paris 168: 787–790. *9 fig.* 1919.—Ten types of vascular supply in the petioles of members of the sub-families Papilionatae and Mimosoideae are described and figured. In a previous paper (Compt. Rend. 167: 205. 1918) the leaf traces in the Caesalpinioideae were described.—The three sub-families of the Leguminosae present types of leaf traces with medullary strands similar to those of the Chrysobalanoideae of the Rosaceae; this character is encountered even in such widely separated genera as *Swartzia*, *Affonsea* and *Bocoa*. The most highly specialized forms possess the simpler trace.—Subdivisions of the Papilionatae agree in leaf trace anatomy with the exception of the Astragaleae, in which are encountered the various types characteristic of the other tribes. This may represent a stock from which the others have been derived. Moreover, the Astragaleae, through the Sophoreae, seem to be related to types possessing medullary strands, thus constituting an assemblage of closely related forms, to which are attached the different sub-families of the Leguminosae.—*F. B. Wann.*

572. Nelson, J. C. **Monomorphism in Equisetum Telmateia Ehrh.** Amer. Fern Jour. 9: 93–94. 1919.

573. Nelson, J. C. **Another "freak" Equisetum.** Amer. Fern Jour. 9: 103–106. *Pl. 6.* 1919.—Linn County, Oregon, is a new locality for *Equisetum fluviatile* L. Among the specimens collected was one, *E. fluviatile* var. *polystachyum*, which had 31 branches of the two upper whorls bearing strobiles at the tip.—*F. C. Anderson.*

574. Sahni, B. **On certain archaic features in the seed of Taxus baccata, with remarks on the antiquity of the Taxineae.** Ann. Botany 34: 117–134. *7 fig.* 1920.—It is suggested that the Palaeozoic seeds *Cardiocarpus*, *Cycadinocarpus*, *Mitrospermum*, and *Taxospermum*, all

of which probably belonged to the Cordaitales, form a series illustrating a general tendency, a continuation of which has resulted in the production of the type of seed found in *Taxus*, as well as in *Torreya* and *Cephalotaxus*. This tendency may be summarized as follows: The point of origin of the "outer" system of vascular strands shifts nearer and nearer the subnucellar pad of tracheids which gives rise to the "inner" system. During this process the bundles of the outer system cut through the "stone." The canals through the stone then move forward toward the micropyle so that for an increasing distance the bundles come to lie inside the stone. At the culmination of the process when they lie entirely within the stone the condition found in *Taxus* is reached. In this genus the "inner" system of bundles has disappeared. The seeds of *Torreya* and *Cephalotaxus* are derived from the same source by a modification of the same tendency. On the basis of this theory these three genera are the nearest existing relatives—apart from *Ginkgo*—of the Cordaitales and like *Ginkgo* have been derived directly from the Cordaitales. It is proposed to place them in a separate group the Taxales, distinct from Coniferales and nearer *Ginkgo*.—*W. P. Thompson.*

575. St. John, Harold. **The genus Elodea in New England.** Rhodora 22: 17–29. 1920. —See Bot. Absts. 5, Entry 451.

576. Salisbury, E. J. **Variation in Anemone apennina, L., and Clematis vitalba, L., with special reference to trimery and abortion.** Ann. Botany 34: 107–116. *9 fig.* 1920.—This paper furnishes additional data supporting the author's previously published views concerning the essential trimery of the Ranunculaceous flower and the causes of variation in the numbers of the constituent parts. Curves are given showing the variation in the number of stamens, carpels, and perianth parts in a large number of flowers of the species studied. The curves show marked periodicity, the crests occurring at multiples of three. In more than half the flowers of *Anemone apennina* the stamens and carpels are in multiples of three. Evidence is given to show that congenital fission is the chief cause of variation in number, though transformation of stamens into perianth parts was also observed.—*W. P. Thompson.*

577. Schaffner, John H. **Dieciousness in Thalictrum dasycarpum.** Ohio Jour. Sci. 20: 25–34. 1919.—Intermediate forms between extremes of staminateness and carpellateness are described. Great diversity of sexual expression is found on different branches of the same inflorescence. It is concluded that maleness or femaleness is determined by the physiological state at the inception of the sporophylls; or that if sex has been determined earlier, it is later reversed. A general survey of the origin and nature of dieciousness in sporophytes is given, showing evolutionary gradations from the bisporangiate to the monosporangiate condition in various groups.—*H. D. Hooker, Jr.*

578. Seward, A. C. [Rev. of: Chamberlain, C. J. **The living cycads.** Univ. Chicago Science Ser. *172 p. 91 fig.* Univ. Chicago Press: Chicago, 1919.] New Phytol. 18: 262. 1919.

579. Small, James. **The origin and development of the Compositae. Miscellaneous topics.** New Phytol. 18: 129–176. *Fig. 64–78.* 1919.—See Bot. Absts. 5, Entry 720.

580. Small, James. **The origin and development of the Compositae. General conclusions.** New Phytol. 18: 201–234. *Fig. 79.* 1919.

581. Souèges, R. **Embryogenie des Polygonacées. Developpement de l'embryon chez le Polygonum Persicaria L. [Development of the embryo of Polygonum persicaria L.]** Compt. Rend. Acad. Sci. Paris 168: 791–793. *8 fig.* 1919.—The two-celled proembryo of *Polygonum persicaria L.* gives rise, by a series of transverse divisions, to six layers of cells, the upper two being derived from the apical cell and the lower four from the basal cell. The two layers produced from the apical cell give rise respectively to the cotyledons, as in the Ranunculaceae and Cruciferae, and to the upper portion of the hypocotyl. In the Ranunculaceae and Cruciferae the corresponding layer gives rise to the complete hypocotyl. The four layers derived from the basal cell of the two-celled proembryo give rise respectively to (1) the lower portion of the hypocotyl; (2) the root cap; and (3) and (4) a rudimentary suspensor.—*F. B. Wann.*

582. Spratt, Amy Vera. Some anomalies in monocotyledonous roots. Ann. Botany 34: 99–105. *Pl. 3, 1 fig.* 1920.—Members of several monocotyledonous natural orders show an anomalous root condition consisting in the filling in of a large pith with scattered vascular strands. These may be formed by secondary growth (*Dracaena*) or differentiated at the growing point (*Pandanus, Yucca*) and at later stages may form a solid stele in some cases. The secondary thickening in *Dracaena* may occur in the pericycle or in cortical layers.—*W. P. Thompson.*

583. Sprecher, A. **Étude sur la semence et la germination du Garcinia mangostana L.** [**A study of the seed and germination in Garcinia mangostana L.**] Rev. Gén. Bot. 31: 513–531, 609–634. *Pl. 5–7, 34 fig.* 1919.—In the East Indian "mangosteen," a member of the Guttiferae, the ovule is anatropous and has two integuments. During the development of the embryo sac the nucellar cells are absorbed, the sac coming to life directly against the inner integument. The cells of the latter bud into the sac and form an embryo, which becomes detached from the integument and is completely surrounded for a time by the endosperm cytoplasm with its free nuclei; these soon disappear. When fully developed the embryo has the form of a swollen tubercle which represents the hypocotyl: there is no trace of root, stem, or cotyledons. Two or three such embryos are occasionally developed in one embryo sac, forming a compound tubercle. The central cylinder which differentiates in the tubercle usually lies along the longitudinal axis of the latter, but in many cases it develops in an oblique or transverse position. Normal fertilization and embryogeny also occur.—The course of the vascular bundles in the flower and fruit is followed, and it is shown that the white pulp in which the seed lies (usually only one seed matures) represents the endocarp; this separates at an early stage from the red mesocarp, becomes divided into sections, and grows fast to the integument. The histological changes occurring during the development of the fruit are described.—At germination a root and a stem grow out from the embryonal tubercle and develop very slowly. If the stem and a portion of the tubercle be removed a new stem is regenerated. In polyembryonic seeds more plantlets develop from the tubercle. The primary root has no root hairs, but the walls of certain epidermal and hypodermal cells remain thin; water enters at these points.—The arrangement of vascular bundles in the seedling and the histology of its various parts are briefly described. In root, stem, leaf and fruit there is a system of secretory canals which arise schizogenously.—*L. W. Sharp.*

584. Stout, A. B. **Intersexes in Plantago lanceolata.** Bot. Gaz. 68: 109–133. *2 pl.* Aug., 1919.—See Bot. Absts. 3, Entry 1518.

585. Styger, Jos. **Beiträge zur Anatomie des Umbelliferen-früchte.** [**Contribution on the Anatomy of Umbelliferous Fruits.**] Schweiz. Apotheker Zeitg. 57: 199–205, 228–235. *7 fig.* 1919.—See Bot. Absts. 5, Entry 831.

586. Turrill, W. B. **Observations on the perianth in Ranunculus auricomus and Anemone coronaria.** New Phytol. 18: 253–256. *3 fig.* 1919.—The author describes transition stages between stamens and petals, petals and sepals, and sepals and bracts in *Ranunculus*; and notes a sepal occurring in the whorl of bracts in *Anemone.*—*I. F. Lewis.*

587. Weatherwax, Paul. **Paraffin solvents in histological work.** Bot. Gaz. 68: 305–306. Oct., 1919.—The sinking of paraffin in the replacement of xylol may be avoided by running a current of cold air through the melted paraffin, thus causing it to harden as a frothy mass of lessened specific gravity. Before allowing it to harden, the mass is kneaded to secure finer grain and a more even distribution of the air bubbles. The author, however, does not find any special disadvantages in the old method, and sees no valid reason for the rather general abandonment of the use of chloroform as a medium for the introduction of paraffin.—*H. C. Cowles.*

588. Weingart, Wilh. **Vom Reif des Cereus trigonus Haw. var. guatemalensis Eichl.** [**The bloom on Cereus trigonus var. guatemalensis.**] Monatsschr. Kakteenkunde 29: 80–84. 1919.—The author shows that the bloom contains resin as well as wax.—*A. S. Hitchcock.*

589. Weingart, Wilh. **Sphärite im Hypoderm von Cereen.** [Sphere crystals in the hypoderm of Cereus.] Monatsschr. Kakteenkunde 29: 45–48. 1919.—An account is given of the sphere crystals in *Cereus Hirschtianus* and *C. Lauterbachii*, and of the effect upon them of various reagents. The spherites contain no proteids and are allied to inulin. They constitute reserve material.—*A. S. Hitchcock.*

590. Woodward, R. W. **Further notes on Philotria.** Rhodora 21: 218–219. 1919.—In a recent issue (Rhodora 21: 114. 1919.), writer reported what appeared to be *Philotria angustifolia* growing in brackish water at Old Lyme, Connecticut. On revisiting the station in August 1919 both flowers and fruit were examined while fresh, and from this examination detailed descriptions of the staminate and pistillate flowers and the fruit are given. Writer has not had an opportunity to verify his identification by comparison with authentic material but believes that it is *P. angustifolia* or some species closely related to it.—*James P. Poole.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. Transeau, *Editor*

591. Børgesen, F. **The marine algae of the Danish West Indies. Vol. 3. Rhodophyceae.** Dansk Bot. Ark. 3: 145–240. *Fig. 149–230.* 1917.—This part completes the family Squamariaceae, from p. 144, 1915, of the same volume. (This family contributed by Mme. A. Weber-van Bosse), and includes the families Hildenbrandiaceae, Corallinaceae (the subfamily Melobesieae by Mme. Paul Lemoine, text in French) and part of the Ceramiaceae. New are *Amphiroa rigida* Lamour. var. *antillana* Børgesen; *Mesothamnion caribaeum*, nov. gen. & sp. Børgesen; *Antithamnion antillarum* Børgesen; *Spyridia aculeata* var. *disticha*, and its forma *inermis* Børgesen. New combinations: *Lithophyllum accretum* (Fosl. & Howe) Lemoine; *Lithophyllum* (?) *propinquum* (Fosl.) Lemoine; *Melobesia* (*Lithoporella*) *atlantica* (Fosl.) Lemoine; *Melobesia* (*Litholepis*) *affinis* (Fosl.) Lemoine; *Porolithon mamillare* (Harv.) var. *occidentale* (Fosl.) Lemoine; *Porolithon Boergesenii* (Fosl.) Lemoine. Mme. Lemoine's treatment of the Melobesieae has a key to the 20 species, and list of the other species known from the Antilles as a whole; also a comparison with the species of other regions, showing a strong resemblance to those of the Mediterranean, and a somewhat less marked though still distinct resemblance to those of the Indo-Pacific. 19 of the 20 species are figured, either in section or in habit or both; most of them for the first time. Two species are recorded for the first time in America: *Jania adhaerens* Lamour., of the Red Sea, Indian Ocean and Japan; and *J. decussato-dichotoma* Yendo, of Japan. *Jania* sp., *Griffithsia* sp., *Callithamnion* sp., *Antithamnion* sp., are described and the last two figured; probably new, but sterile.—*Frank S. Collins.*

592. Børgesen, F. **The marine algae of the Danish West Indies. Vol. 3. Rhodophyceae.** Dansk Bot. Ark. 3: 241–304. *Fig. 231–307.* 1918.—Completes the family Ceramiaceae and begins the family Rhodomelaceae. New are *Laurencia chondrioides* Børgesen; *Polysiphonia sphaerocarpa* Børgesen.—*Frank S. Collins.*

593. Børgesen, F. **The marine algae of the Danish West Indies. Vol. 3. Rhodophyceae.** Dansk. Bot. Ark. 3: 305–368. *Fig. 308–360.* 1919.—Completes the family Rhodomelaceae and covers the families Delesseriaceae, Bonnemaisoniaceae, Gigartinaceae, and Rhodophyllidaceae. New are *Dasya caraibica* Børgesen; *Cottoniella arcuata* Børgesen, nov. gen. et sp. *Dasya* sp. is described and figured, probably new species but sterile. For *Lophocladia trichoclados* are described and figured the cystocarps and antheridia, hitherto unknown. As in previous parts of this paper, full descriptions are given of all species, and many details are described and figured for the first time.—*Frank S. Collins.*

594. Boyer, Charles S. **Rare species of North American Diatomaceae.** Bull. Torrey Bot. Club 47: 67–72. *Pl. 2.* 1920.—The following new species of diatoms are described: *Auliscus floridanus*, *A. hyalinus*, *Dimerogramma intermedium*, *Glyphodesmis tumida*, *G. campechi-*

ana, *Synedra anguinea*, *S. incisa*, *Eunotia Stevensonii*, *Pinnularia Hagelsteinii*, *Nitzchia semicostata*, and *Surirella Palmeri*. *Navicula Attwooddii* M. Perag. and an abnormal form of *Aulodiscus oregonus* Harv. & Bail. are discussed.—*P. A. Munz.*

595. Bristol, B. Muriel. **On the alga-flora of some desiccated English soils: an important factor in soil biology.** Ann. Botany 34: 35–80. *Pl. 11. 12 fig.* 1920.—By means of water cultures it is show that there is a widely distributed plant association in cultivated soils consisting of moss protonema and algae. Sixty-four species and varieties of algae were identified. All these algae can withstand from four to twenty-six weeks desiccation. Descriptions of the algae including six new species are given.—*E. N. Transeau.*

596. Bullock-Webster, G. R. **A new nitella.** Irish Nat. 28: 1–3. *Pl. 1.* 1919.—*Nitella spanioclema*, a new species collected at Lough Shannach, County Donegal, Ireland.—*W. E. Praeger.*

597. Carter, Nellie. **On the cytology of two species of Characiopsis.** New Phytol. 18: 177–186. *3 fig.* 1919.—See Bot. Absts. 5, Entry 118.

598. Church, A. H. **Historical Review of the Florideae II.** Jour. Botany 57: 329–334. 1919 (continued from *Ibid.* 57: 304).—The Florideae represent an independent line of evolution in the sea from the ancestral stage of encysted plankton-flagellates, attaining somatic and reproductive specialization along their own lines. Nuclear migrations and haustorial connections of the carpospore are but an extension of secondary pit-connections and migration in the somatic organization. Cenocytic decadence of the trophocyte is paralleled by the secondary coenocytic organization in the vegetative soma of distinct generic types.—Progressive differentiation of the sex mechanism leads through inevitable stages to oogamy and fertilization *in situ*, following the failure of the oospore to be discharged, thus giving rise to many separate phyla of algae. Though efficient in economy of materials, this method leaves dispersal unprovided for.—Most important in the Floridae, however, is not the fertilization *in situ* with a parasite zygote and a sporophyte generation producing spores, but the presence of three successive generations as follows: (I.) Gametophyte, (II.) Carposporophyte (diploid) and (III.) Tetrasporophyte (haploid). In (I.) there is the most complete economy in the sexual process. The gametes are expressed as mere nuclei, a condition otherwise attained only in the Angiosperms. There is also post-sexual nutrition. This is made possible by the mechanism of the pit-connections left open at the base of the young carpogonium. In (II.) the generation is asexual. Whether it be haploid or diploid does not matter, but there has been no inducement to a haploid condition. It is a very much reduced stage. In (III.) the spores are immediately dispersed and take the small chance of immediate germination. They grow to a free autotropic soma, but there is a reduction to the haploid condition at the formation of tetraspores.—The haploid spores on germination give a haploid soma which is normally free and autotropic, and which may be sexual and repeat the sequence, though it may as well be asexual. Of special interest are cases where the tetraspore formation is wanting and reduction is otherwise provided for, but the locus of the process is wholly subsidiary and secondary. The condition in *Scinaia* and *Nemalion* in this respect is discussed. —The clue to the peculiar behavior of the zygote and young carposporophyte in its relation to the auxiliary cells is seen in its practically holoparasitic habit. The passage of food material quickly is rendered possible by the mechanism of secondary pit-connections dependent on the soft penetrable wall-membrane.—The clearest view of the Florideae is that they consist of a multitude of distinct phyla as the survivors of a specialized and circumscribed ancient race of Marine Algae. All of the living representatives are on a closely comparable physiological plane, but the phyla diverge as to somatic construction and organization and as to internal economy, becoming more specialized in relation to the parasitic carposporophyte.—The phases of haustorial connection, progressively more intricate and devastating in relation to the parental thallus they drain, constitute but one aspect of the question. The production of the cystocarpic wall after fertilization passing to the initiation of these structures before fertilization represents a specialization of great significance. A true phytogenetic classi-

fication should thus combine: (1) the auxiliary cell standpoint of Schmitz, with (2) the special feature of thallus-organization, and (3) adult cystocarpic-differentiation, more clearly recognized as significant by the older algologists (Harvey). [See also Bot. Absts. 4, Entry 1014.]—*K. M. Wiegand.*

599. Coulter, J. M. **Alaria.** [Rev. of: Yendo, Kichisaburo. **A monograph of the genus Alaria.** Jour. Coll. Sci. Imp. Univ. Tokyo, 43[1]: *145 p. 19 pl.* 1919. (See Bot. Absts. 5, Entry 612.)] Bot. Gaz. 68: 151–152, 1919.

600. Ducellier, F. **Contribution à l'Etude de la flore desmidiologique de la Suisse.** [A contribution to the study of the Desmid flora of Switzerland.] Bull. Soc. Bot. Genève 10: 85–154. *3 pl., 134 fig.* 1918.—The many species of *Desmids* found at five different stations are enumerated with detailed notes and figures. Many of the species are new to Switzerland.—*W. H. Emig.*

601. Ducellier, F. **Etude critique sur Euastrum ansatum Ralfs et quelques-unes de ses variétés Helvétiques.** [A critical study of Euastrum ansatum Ralfs and some of the Swiss varieties.] Bull. Soc. Bot. Genève 10: 35–46. *29 fig.* 1918.—*Euastrum ansatum* Ralfs var. *simplex* n. var., also the new varieties *commune, dideltiforme, robustum,* and *rhomboïdale,* are figured and described in detail.—*W. H. Emig.*

602. Ducellier, F. **Trois Cosmarium nouveaux.** [Three new forms of Cosmarium.] Bull. Soc. Bot. Genève 10: 12–16. *3 fig.* 1918.—The three new forms of *Cosmarium* described and figured include: (1) *C. obliquum* Nordst. form *minutissima* n. form., the smallest known form of this species; *C. crassangulatum* Borge, var. *Champesianum* n. var. differs from the species in size and the papillose nature of the cell wall; and *C. Hornavanense* (Schmidle) Gutwinski form *Helvetica* n. form.—*W. H. Emig.*

603. Ghose, S. L. **A new species of Uronema from India.** Ann. Botany 34: 95–98. *15 fig.* 1920.—*Uronema indicum* from Lahore, India, is described, bringing the number of species in this genus up to four.—*E. N. Transeau.*

604. Groves, James. **Sex-terms for plants.** Jour. Botany 58: 55–56. 1920.—See Bot. Absts. 5, Entry 560.

605. Hodgetts, William J. **Roya anglica G. S. West. A new Desmid; with an emended description of the genus Roya.** Jour. Botany 58: 65–69. 1920.—The author has compiled the account of this new species from descriptions, notes and drawings by G. S. West. The form of the vegetative cell is cylindrical or subcylindrical, unconstricted and very slightly tapering toward each end where it is subtruncate. The zygospore is globose with a hyaline smooth wall. The chief distinctions on which *Roya* can be retained as a genus are: (1) the simple structureless nature of the wall; and (2) the delay in the division of the chloroplast until the cell has reached maturity.—*K. M. Wiegand.*

606. Howe, Marshall A. **Observations on monosporangial discs in the genus Liagora.** Bull. Torrey Bot. Club. 47: 1–8. *Pl. 1, fig. 25–29.* 1920.—The genus *Liagora* of the marine red algae of the family Nemalionaceae is made up of species mostly dioecious, some being monoecious. Some species often have small flat orbicular discs of a deep red color and bearing on their distal surface a few sporangia the contents of which remain undivided. The lack of any obvious genetic connection between these and the *Liagora* makes them appear to be independent of it. They probably arise from gonidia, gemmae, or aplanospores which come from terminal or subterminal cells of the assimilatory filaments of the *Liagora.*—*P. A. Munz.*

607. Lucas, A. H. S. **Notes on Australian Marine Algae, II. Description of four new species.** Proc. Linnean Soc. New South Wales 44: 174–179. *Pl. 6.* 1919.—*Laurencia infestans* is described and figured and *Falkenbergia olens, Polysiphonia zostericola* and *Trichodesmium scoboideum* are discussed in detail.—*Eloise Gerry.*

608. Meister, Fr. Zur Pflanzengeographie der schweizerischen Bacillariaceen. [On the plant geography of the Swiss Bacillariaceae.] Bot. Jahrb. 55 (Beiheft): 125-159. *2 fig.* 1919. —Brun in 1880 described 32 genera and 182 species from Switzerland; Meister in 1912 listed 45 genera and 376 species, or including varieties 621 forms. The greater proportion of the Swiss diatoms occurred also in the Tertiary. About one-half of the Tertiary diatomaceous flora has persisted down to the present: thus when compared with the Phanerogams the conservative nature of the diatoms is apparent. The number that have appeared since Tertiary times is less than those that have perished so that the diatoms seem to be a waning group. Tertiary species common to central France and Hungary must have arisen in pretertiary times, therefore in the Cretaceous or Jurassic. The oldest known genera of fresh water Bacillariaceae are Epithemia, Rhopalodia, and Melosira. The Swiss diatom flora shows a much closer relation to the west European than to the east European tertiary flora. Several old tertiary forms are now found living only in Switzerland. The oldest forms from the Oligocene or those of the Miocene of west or east Europe now inhabit the bottoms of the Swiss lakes. There are many diatoms in the Alps and in the colder lakes of the lowlands that occur elsewhere only in the far north or in central Asia. Meister believes that Diatoms have migrated from central Asia to the Alps and the Arctic region rather than the reverse. Why are there so many endemic species in Switzerland when diatoms are generally so ubiquitous? There is no good explanation at present, but the author assumes as a working hypothesis that the relics have descended from preglacial times and that conditions during or before the glacial period were different from what is generally believed. Meister shows that many diatoms inhabit both highland and lowland lakes and are therefore not sensitive to variations in warmth; more than three-fourths were found to be indifferent. Extensive lists are given in various portions of the paper. *Navicula acuta* n. sp. is described.—*K. M. Wiegand.*

609. Pilger, R. Ueber Corallinaceae von Annobon. [On the Corallinaceae of Annobon.] Bot. Jahrb. 55: 401–435. *55 fig.* 1919.—This paper is the first report on the algae collected in 1911 by Dr. J. Mildbraed on Annobon, the smallest of the Guinea Islands, where the black calcareous rocks support a rich flora of marine algae. These lime-loving algae inhabit a zone between low and high tides which is wider on the west coast where the waves are high, and narrowest on the north where there is simply the swell of the ocean. The Corallinaceae are often very delicately colored. The decalcified material was imbedded in paraffin, sectioned and stained with Ruthenian red, Bismark brown, chlor-iodide of zinc, or haematoxylin. A brief account of the genus Goniolithon Foslie is given together with Foslie's diagnosis of the genus, and Harvey's description of *G. mamillare* (Harvey) Fosl., the only species found by Mildbraed. This species ranges from Brazil and Terra del Fuego to Cape Verde and Algoa Bay. Foslie suggests that *G. mamillare* may be a juvenile form of *G. brassica-florida*. Pilger gives extended descriptions of his material under four headings: (1) female material, (2) tetraspore material, (3) inner structure of the conceptacle projections and the branches, and (4) structure of the cortex. The female material formed thin crusts on the rocks with a smooth or uneven surface, the crusts sometimes being proliferous. The tetrasporic material produced crusts on stones or mussels. The cell structure, cell division, plasma membrane, and chromatophores are described, and illustrated. The reaction of the different cells to chlor-iodide of zinc is discussed. Elongation of the cell-rows takes place always by the division of the uppermost cell of the row, and the cells are connected in the direction of growth by peculiar double-faced pits. Heterocysts are formed in *Goniolithon* in 2's or 3's on the surface of the "Vorsprung." The whole floor of the tetrasporic conceptacle is covered with 4-parted tetrasporangia. The female conceptacles are in most cases empty or contain merely the remains of carpospores. The cortex is differentiated into a hypothallus and a perithallus. The cells of the perithallus are rich in starch. *Lithophyllum africanum* Foslie occurs on Annobon. This species forms cornice-like projections from the rock 15 cm. or even 30 cm. broad. The little fan-shaped ends of the inconspicuous branches are arranged story-like on the surface of the mass. *L. Kolschyanum* Unger is next described. This species is often attached to the larger species, *L. africanum*. It has a thin crust with a different type of branching. The crust does not show a real hypothallus with cells running at an angle to those of the peri-

thallus, and there are no pit connections between the cells in the lower layers of the crust. *Lithophyllum leptothalloideum* and *L. Mildbraedii* are described as new. These are thin crustaceous species, the former growing on *L. africanum*, the latter on stones and rocks. The anatomy and reproductive bodies of each are described. *Amphiroa annobonensis* also is described as new. Extended observations are made on the cellwall and tetrad cohesion of the cells in the Corallinaceae. The author finds that a middle lamella is present and therefore the whole gelatinous mass seeming to lie between the cells is really cell wall, and the calcium carbonate is actually deposited in the wall. The contributions of Yendo and Mme. Lemoine are cited. The author differentiates between pores due to the breaking down of the wall and true pits; and considers this to be of systematic value.—*K. M. Wiegand.*

610. Reverdin, L. **Le Stephanodiscus minor nov. spec. et revision du genre Stephanodiscus.** [Stephanodiscus minor n. sp. and a revision of the genus Stephanodiscus.] Bull. Soc. Bot. Genève **10**: 17–20. *22 fig.* 1918.—A new species of *Stephanodiscus* (Diatom) with three to six silicious appendages is described and compared with the other two species of the same genus.—*W. H. Emig.*

611. Smith, Catharine, W. **Variation in the number of ribs in Costaria costata.** Publ. Puget Sound Biol. Sta. **2**: 207–312. 1919.—While the number of ribs reported in literature is 3-5, the author finds that the number may be as high as 11. The number is not necessarily constant throughout the length of the same frond.—*T. C. Frye.*

612. Yendo, K. **A monograph on the Genus Alaria.** Jour. Coll. Sci. Imp. Univ. Tokyo **43**: 1. 1919.—Deals mainly with the taxonomy of this genus but considers briefly various morphological details, the economic uses, and the distribution of these large marine algae. A considerable bibliography is included.—*G. J. Peirce.*

613. Zimmermann, Ch. **Quelques diatomées nouvelles ou curieuses.** [Some new or peculiar diatoms.] Broteria Ser. Bot. **17**: 97–100. *Pl. 3* (*5 fig.*). 1919.—Eight of the nine forms mentioned are proposed as new, viz.: *Navicula cardinaliculus* var. *margaritacea*, *N. Jequitinhonhae*, *N. Torrendii* with var. *capitata* and forms *typica* and *nana*, *N. mutica* var. *rhombica*, *Achnanthes lanceolata* var. *brasiliensis*, *Fragilaria undulata* var. *brasiliensis*. All forms mentioned are figured, and all are from Brazil.—*Edward B. Chamberlain.*

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

Alexander W. Evans, *Editor*

614. Amann, Jules. **Additions à la flore des mousses de la Suisse.** [Additions to the moss flora of Switzerland.] Bull. de la Murithienne **1916–18**: 42–66. 1919.—The author first gives a large number of localities extending the range of species listed in the Flore des mousses de la Suisse [see Bot. Absts. 4, Entry 1032], and mentions a number of forms now first reported for the region, usually accompanying these reports with short descriptive notes. He proposes the following species as new: *Amblystegium ursorum*, *Bryum perlimbatum*, *Ceratodon mollis*, *Desmatodon spelaeus*, *Didymodon riparius* (not Kindb.), *Lesquereuxia glacialis*, *Mnium adnivense*, *Pseudoleskeella ambigua*, *Ptychodium abbreviatum*, *P. albidum*, and *P. pallescens*. Under the genus *Ptychodium* he gives a key to the Swiss species and states that between *Lesquereuxia saxicola* and *Ptychodium plicatum* a long series of transitional forms occurs, so that sterile material can not be definitely determined. At the conclusion of the paper he lists, as an example of the general trend of moss associations in the high-alpine region, twenty-one mosses and one hepatic found growing on the mica-schist of the Combin de Corbassière (Pennine Alps) at an altitude of 3600–3700 m.—*Edward B. Chamberlain.*

615. Bristol, B. Muriel. **On the gemmae of Tortula mutica, Lindb.** Ann. Botany **34**: 137–138. *5 fig.* 1920.—This is a note recording the discovery of a specimen of *Tortula mutica* which bore numerous gemmae scattered over the surface of the leaf. The gemmae are borne on one-celled stalks and generally consist of two or four cells.—*W. P. Thompson.*

616. Britton, E. G. **Mosses of Bermuda.** Bryologist 22: 87. 1919.—This list of twenty-two species is an enumeration without comment of the forms mentioned in the recently issued Flora of Bermuda by Britton and others.—*Edward B. Chamberlain.*

617. Brotherus, V. F., and W. W. Watts. **The mosses of North Queensland.** Proc. Linnaean Soc. New South Wales 43: 544–567. 1918.—In a foreword the second author gives a brief description of the region where most of his collections were made and refers to the important work on the mosses of Queensland done by F. M. Bailey. He calls attention to the fact that the species of North Queensland are Malasian rather than Australian in their affinities. He notes further that, as a result of his explorations, one new genus and fourteen new species have been brought to light, that 17 other genera and 30 other species have been added to the flora of Australia, and that numerous species, heretofore known only from other parts of Australia, can now be definitely recorded from Queensland. In the main body of the work a list of species is given, with localities and occasional notes on distribution, and the new genus and new species are described. The new genus, *Pterobryidium* Broth. & Watts., is related to *Pterobryopsis* Fleisch. and is based on a single species. The new species are the following, Brotherus and Watts being the authorities except where otherwise noted: *Brachymenium Wattsii* Broth., *Bryum kurandae*, *Campylopus Wattsii* Broth., *Chaetomitrium entodontoides*, *Dicranoloma Wattsii* Broth., *Ectropothecium serriofolium*, *Floribundaria robustella*, *Fissidens cairnensis*, *F. kurandae*, *Pterobryidium australe*, *Pterobryopsis filigera*, *Syrrhopodon cairnensis*, *Taxithelium Wattsii* Broth. and *Trichosteleum elegantulum*. To these should be added *Mniodendron comatulum* Geheeb, a manuscript species here described for the first time. —*A. W. Evans.*

618. Chamberlain, Edward B. [Rev. of: Amann, J., and C. Meylan. **Flore des mousses de la Suisse.** [Flora of the mosses of Switzerland.] Genève, 1918. (See also Bot. Absts. 4, Entry 1032.)] Bryologist 22: 41–43. 1919.—The reviewer criticises the method employed by the authors in the citation of authorities for binomials. In all cases the original authority for the species is given, but when this name appears in parentheses the authority for the combination is not indicated in any way; the reader, therefore, unless thoroughly conversant with the literature, is in doubt as to "whether the combination be 'new' or not." In other respects the reviewer speaks in high terms of the work.—*A. W. Evans.*

619. Corbière, L. **Deux mousses africaines également françaises.** [Two African mosses occurring likewise in France.] Rev. Bryologique 41: 84–85. 1914. [Issued in 1919.]—In this paper (which is to be continued) the discovery of *Grimmia Pitardi* Corb. in the department of Var in southern France is announced. The species was described in 1909 from specimens collected in Tunis and has since been recorded from Tripoli. A full description is included. —*A. W. Evans.*

620. Dixon, H. N. **Rhaphidostegium caespitosum (Sw.) and its affinities.** Jour. Botany 58: 81–89. 1920.—The author's first impression of *Rhaphidostegium sphaerotheca* (C. M.) Jaeg., obtained from material collected on Table Mountain, Cape Colony, led him to believe that it was a well-marked species. Further study, however, showed that this was not the case but that the Table Mountain specimens, which were exceptionally large and fine, belonged to an extensive "Formenkreis," the usual material of which was small and commonplace. In this "Formenkreis" the author was able to include a number of specimens from South and Central Africa and from the Mascarene Islands, some of which had been referred to other species or even to other genera. Previous experience suggested that when a plastic species had a wide African distribution it was well to look further and see if it might not be identical with some South American or Australian species. Acting on this hypothesis the author was able to demonstrate that *R. sphaerotheca* was really a synonym of the American *R. caespitosum* (Sw.) Jaeg., a species originally described by Swartz from West Indian material under the name *Hypnum caespitosum*. He was able to show further, by the study of numerous type-specimens, that *R. caespitosum* had many synonyms and that it had a cosmopolitan range in the tropical and subtemperate portions of the Southern Hemisphere, even extending into

the temperate zone. The best specific characters for this polymorphic species are derived from the perichaetial leaves and capsules, and it seems to be impossible to divide it into definite groups, since the variations run in different directions and are little correlated. Some of the species referred in this paper to *R. caespitosum*, as synonyms, are the following: *Hypnum lithophilum* Hornsch., *Hypnum loxense* Hook., *Leucomium Robillardii* (Duby) Jaeg., *Pterogoniella Stuhlmanni* Broth., *R. agnatum* (Hampe) Jaeg., *R. caespitans* Schimp., *R. Catillum* (C. M.) Jaeg., *R. cucullatifolium* (Hampe) Jaeg., *R. Dicnemonella* (C. M.) Broth., *R. Duisaboanum* (Mont.) Jaeg., *R. fluminale* (C. M.) Broth., *R. inconspicuum* (Hornsch.) Jaeg., *R. Kegelianum* (C. M.) Jaeg., *R. perlaxum* (C. M.) Par., *R. Sauloma* (C. M.) Broth., *R. sphaerotheca* (C. M.) Jaeg., *R. subsphaericarpum* (Hampe & C. M.) Jaeg., *Sematophyllum subnervatum* Mitt., and *Stereodon tristiculus* Mitt. In all 58 synonyms are given.—*K. M. Wiegand.*

621. Douin, Ch., and L. Trabut. **Deux hepatiques peu connues. [Two little known hepatics.]** Rev. Gén. Bot. 31: 321–328. *Pl. 9, 1 fig.* 1919.—Two liverworts from Algeria, *Corbierella algeriensis* Douin & Trabut and *Riccinia perennis* (Steph.) Trabut, are described. The first is probably the same as *Exormotheca Holstii* Steph. but, on account of certain peculiar characters, is made the type of the new genus *Corbierella* Douin & Trabut. The second species, which was originally described by Stephani under the name *Riccia* (*Ricciella*) *perennis*, is the only member of the genus *Riccinia* Trabut, proposed in 1916. The writers regard it as intermediate between the Ricciaceae, with which it is classed, and the Marchantiaceae.—*L. W. Sharp.*

622. Evans, Alexander W. **Notes on New England Hepaticae.—XV.** Rhodora 21: 149–169. *Pl. 126, 14 fig.* 1919.—Under the name *Nardia obscura* the writer describes and discusses a new species, closely related to *N. hyalina* (Lyell) Carringt. and *N. obovata* (Nees) Lindb. It has been observed in several mountainous localities, especially in the White Mountains, and seems to retain its distinctive features even while exhibiting a considerable range of variability. For the sake of comparison the features of *N. hyalina* and *N. obovata* are likewise discussed. Another species, *Cephalozia Loitlesbergeri* Schiffn., is reported for the first time from New England, the first American record having been based on material from Nova Scotia. Additions to local state floras include the following: *Jungermannia sphaerocarpa*, *Calypogeia sphagnicola* and *Notothylas orbicularis* from Maine; *Riccardia pinguis*, *Pellia Neesiana*, and *Lophocolea alata* from Massachusetts. According to the census given at the close of the paper 191 Hepaticae are now known from New England, including 142 from Maine, 151 from New Hampshire, 129 from Vermont, 79 from Rhode Island, 145 from Connecticut, and 62 from all six states.—*James P. Poole.*

623. Harris, G. T. **On Schistostega osmundacea Mohr.** Jour. Quekett Microsc. Club II, 13: 361–374. *2 pl., 2 fig.* 1917.—This moss thrives in crevices, caves, burrows, etc., facing north to northeast, where it is moist but not wet. The capsules are deciduous. Gemmae are formed on the protonema and are disseminated by animals. The flask-shaped cells found on protonema are separation-cells, remaining after the liberation of gemmae. The protonema is made up largely of obconic light-cells, whose structure is discussed, and is almost completely used up in mature plants.—*L. B. Walker.*

624. Kashyap, S. R. **The androecium in Plagiochasma appendiculatum L. et L. and P. articulatum Kashyap.** New Phytol. 18: 235–238. *2 fig.* 1919.—At the end of the paper the author summarizes his conclusions as follows: "Three different considerations, therefore, show that the androecium of *P. appendiculatum* and *P. articulatum* is really homologous with that of the higher Marchantiales in being a branch-system. (1). The arrangement of the scales at the tip of the lobes which is very similar to that at the tip of the vegetative lobe. (2). The repeated branching of the receptacle, two or three times in some specimens. (3). The invariably acropetal succession of the antheridia in all lobes exactly as in *Marchantia*, the highest genus of the Marchantiales."—*I. F. Lewis.*

625. Luisier, A. **Les mousses de Madère.** [Mosses of Madeira.] Broteria Scr. Bot. **17**: 112–142. 1919.—This article is the sixth of a series covering a complete discussion of Madeiran mosses and includes the genera *Bryum* (in part) to *Thamnium*. No new forms are described, but short notes, references, and reprints of original descriptions are appended to many of the species mentioned. More extended and critical discussions occur for *Bryum serrulatum* Card., *Pogonatum subaloides* (C. M.) Jaeg., *Neckera intermedia* Brid., and the species of *Leucodon* and of *Echinodium*.—*Edward B. Chamberlain.*

626. Melin, Elias. **Sphagnum angermanicum n. sp.** Svensk. Bot. Tidskr. [Stockholm] **13**: 21–25. *3 fig.* 1919.—Under the above name the author describes and illustrates a new species of *Sphagnum* which he found in Ångermanland, Sweden, in 1915, 1916 and 1917. It is related to *S. molle* Sulliv.—*W. W. Gilbert.*

627. Paul, H. **Einige für den Bayerischen Wald neue Pflanzen.** [Plants new to the Bavarian Forest.] Mitteil. Bayer. Bot. Ges. Erforsch. Heim. Flora **3**: 467–468. 1918.—The author lists the following four plants as additions to the known flora of the Bavarian Forest: *Scutellaria minor* L., *Sphagnum subbicolor* Hpe., *Bryum cyclophyllum* Br. Eur., and *Catharinaea Hausknechtii* Broth. He describes the exact localities where these plants were found and enumerates various other species, both spermatophytes and bryophytes, which grew in association with them.—*A. W. Evans.*

628. Potier de la Varde, R. **Observations sur quelques espèces du genre Fissidens.** [Observations on certain species of the genus Fissidens.] Rev. Bryologique **41**: 85–92. *Pl. 1.* 1914. [Issued in 1919.]—In the first part of this paper (which is to be continued) the value of apparent dioecism as a specific character in the genus *Fissidens* is discussed. This condition is brought about when the same protonema gives rise to distinct male and female shoots. It thus represents a special form of monoecism, and the student of mosses is cautioned against attributing positive dioecism to a species until the protonemal relations have been established. In the second part of the paper the status of *F. tamarindifolius* Wils. is considered, and the conclusion is reached that it represents a form of *F. inconstans* Schimp. This conclusion is based on the study of a long series of European specimens ranging from England to Italy and the Tirol. The figures were drawn from material collected in the department of the Manche in France.—*A. W. Evans.*

629. Seymour, M. E. **Mosses of the Cascade Mountains, Washington, collected by J. A. Allen.** Bryologist **22**: 85–86. 1919.—This is a list, without comment, of the specimens issued in the somewhat uncommon set of exsiccati mentioned in the title.—*Edward B. Chamberlain.*

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA AND MYXOMYCETES

H. M. Fitzpatrick, *Editor*

630. Adams, J. F. **The alternate stage of Pucciniastrum Hydrangeae.** Mycologia **12**: 33–35. 1920.—Along a path about which hydrangeas and hemlocks were numerous, *Hydrangea arborescens* was found to be heavily infected with *Pucciniastrum Hydrangeae* while the hemlocks were infected with a *Peridermium* stage resembling *P. Peckii*. Inoculation with aeciospores on *Hydrangea arborescens grandiflora* proved successful, mature uredinia appearing in about 12 days. Three other species of cultivated hydrangeas and a species of *Vaccinium* failed to show infections. Because of differences in hosts and in morphology, the *Peridermium* is considered distinct from *P. Peckii* and is technically described, the name *P. Hydrangeae* (Berk. & Curt.) comb. nov. being proposed.—*H. R. Rosen.*

631. ARNAUD, G. **Les Astérinées.** [The "Astérinées."] Ann. École Nation. Agric. Montpellier 16: 1–288. *Pl. 1–53, 22 fig., maps 1–3.* July 1917–August, 1918.—The name Astérinées is given to a group of black, saprophytic fungi which, although taxonomically heterogeneous, are homogenous from the standpoint of biology and climatology. Nearly all Pyrenomycetes belong to this group. The work is divided into three parts: (1) Comparative morphology. (2) Special taxonomy and morphology. The two groups of Pyrenomycetes, viz., Microthyriales and Dothideales are studied and described in detail. (3) Climatology and geographical distribution. A bibliographical index of the most important publications pertaining to these fungi is given.—*F. F. Halma.*

632. ARTHUR, J. C. **Errors in double nomenclature.** Bot. Gaz. 68: 147–148. Aug., 1919.—Attention is called to the difficulties which confront taxonomists working with parasitic fungi, because of the necessity of having accurate taxonomic knowledge of hosts as well as of parasites. Occasion is taken to correct an error in a previous paper by the author (Bot. Gaz. 65: 470–471. 1918. See Bot. Absts. 1, Entry 385). Two species there described as new, *Puccinia Nicotianae* and *P. Acnisti*, growing respectively on *Nicotiana tomentosa* and *Acnistus arborescens*, turn out to be one species, and the host of the two also is identical. The common host now appearing to be *A. aggregatus*, the correct name of the parasite is *Puccinia Acnisti.*—*H. C. Cowles.*

633. BACHMANN, E. **Neue Flechtengebilde.** [New lichen structures.] Ber. Deutsch. Bot. Ges. 36: 150–156. *Pl. 3.* 1918.—Studies of microtome sections of the thalli of limestone-inhabiting lichens containing *Chroolepus* or *Scytonema* as gonidia show three new points: (1) Spheroidal cell-clusters made up of groups of pseudoparenchymatous cells and storing oils; (2) "Hyphal knots," similar in structure, but without the oil and believed to serve for water-storage; and (3) Wandering gonidia, which are free from connection with the hyphae, occur more deeply situated than the usual gonidia, and are yellow-red instead of green.—*L. W. Riddle.*

634. BOKURA, U. **A bacterial disease of lily.** Ann. Phytopath. Soc. Japan 1²: 36–90. *Pl. 1–2.* 1919.—See Bot. Absts. 4, Entry 1243.

635. BREED, R. S., AND H. J. CONN. **The nomenclature of the Actinomycetaceae.** Jour. Bact. 4: 583–602. 1919.—A review of the literature relative to the proper generic names to be used in the family Actinomycetaceae is given, followed by a discussion in which the conclusion is reached that the generic name *Actinomyces* Harz should be used rather than *Streptothrix* Corda, *Streptothrix* Cohn, *Discomyces* Rivolta, or *Actinocladothrix* Afanasiev and Schultz. *Nocardia* Trevisan may be used as a subdivision of the genus *Actinomyces*. *A. bovis* Harz may be considered as the type species.—*Chester A. Darling.*

636. BURGER, OWEN F. **Sexuality in Cunninghamella.** Bot. Gaz. 68: 134–146. Aug., 1919.—See Bot. Absts. 3, Entry 2096.

637. CHOU, CHUNG LING. **Notes on fungous diseases in China.** [Text in Chinese.] Khu Shou [Science-Publication of the Chinese Science Society] 4: 1223–1229. *Fig. 1–16.* 1919.—See Bot. Absts. 5, Entry 732.

638. CLARK, PAUL F., AND W. H. RUEHL. **Morpholgical changes during the growth of bacteria.** Jour. Bact. 4: 615–625. 1919.—Seventy strains of bacteria representing 37 species, many of which were pathogenic forms, were studied as to the variation in size, shape, characteristic groupings, and staining when grown for different periods of time on ordinary culture media. The conclusions were that in all strains examined excepting those of the diphtheria group and possibly *B. mallei* the organisms found in cultures four to nine hours old are much larger than in older cultures. The period when the largest organisms are found corresponds closely to the period when the cells are dividing rapidly. In the diphtheria group the organisms in cultures of from 4 to 9 hours old are definitely smaller and more solid staining than in older cultures.—*Chester A. Darling.*

639. Colosi, G. Contributo alla conoscenza dei Licheni della Sardegna. [Some Lichens of Sardinia.] Malpighia 28: 458–471. 1919.—Lists 115 species and varieties, two of the varieties being new.—*L. W. Riddle.*

640. Dittrich, G. Über Vergiftungen durch Pilze der Gattungen Inocybe und Tricholoma. [Poisoning caused by species of Inocybe and Tricholoma.] Ber. Deutsch Bot. Ges. 36: 456–459. 1918.—*Inocybe sambucina* is reported to have caused severe poisoning. However, since the species has not been identified with certainty and no specimens could be obtained the following season, it is doubtful whether the fungus in question or some other organism was responsible. *Tricholoma tigrinum* and related species are considered harmless by some and poisonous by others.—*Ernst Artschwager.*

641. [Dodge, B. O.] Anonymous. **Index to American mycological literature.** Mycologia 12: 55–58. 1920.

642. Doidge, E. M. **An interesting group of leaf fungi.** South African Jour. Nat. Hist 1: 164–171. *4 fig.* 1919.—An account of the *Perisporiaceae* and *Microthyriaceae*, is given in a non-technical style, including methods of collecting, preserving and making microscopic preparations.—*E. M. Doidge.*

643. Dufrenoy, Jean. Sur les maladies parasitaires des Chenilles processionaires des Pins d'Arachon. [Concerning parasitic maladies of caterpillars.] Compt. Rend. Acad. Sci. Paris 168: 1345–1346. 1919.—Brief descriptions of various bacteria and higher fungi found growing as parasites on certain larvae. Those mentioned are: *Bacterium pityocampae*, *Streptococcus* sp., *Beauveria globulifera* (J. Beauverie) and *Penicillium* sp.—*V. H. Young.*

644. Emile-Weil, P., and L. Gaudin. **Contribution à l'étude des onychomycoses—Onychomycoses à Penicillium, à Scopulariopsis, à Sterigmatocystis, à Spicaria.** [Contribution to the study of onychomycoses due to Penicillium, etc.] Arch. Méd. Exp. et Anat. Path. Paris 28: 452–467. *Pl. 12, 4 fig.* 1919.—Mycoses of the nails are not uncommon, but have been given little study. They are mostly confined to the toe-nails, particularly those of the big toes. The pathological aspects are discussed briefly. Reports are given of *Penicillium brevicaule* var. *hominis* (=*Scopulariopsis Koningi* Vuill.), *Scopulariopsis cinerea* n. sp., *Spicaria unguis* n. sp., *Sterigmatocystis unguis* n. sp. The cultural characteristics of these fungi are described, as well as their morphology. Their mode of infection is probably through lesions. They frequently follow frost injury.—*E. A. Bessey.*

645. Eriksson, Jakob. Sur l'hétéroecie et la specialisation du Puccinia caricis, Reb. [On heteroecism and specialization in Puccinia caricis Reb.] Rev. Gén. Bot. 32: 15–18. 1920.—After a large number of collections and inoculation experiments author divides *Puccinia caricis* into 3 species: *P. Caricis diffusa*, with aecidia on Urtica and Ribes: *P. caricis-Urticae* (*P. Urticiae-caricis*, Kleb.), with aecidia on Urtica; and *P. caricis-Ribis* (*P. Ribesii*, *Caricis*, Kleb.), with aecidia on Ribes. Under the last named are 3 sub-species: *P. Caricis-Ribis, diffusa*; *P. caricis-Grossulariae*; and *P. caricis-Ribis-nigri.*—*L. W. Sharp.*

646. Fragoso, Romualdo Gonzalez. **Notes and communications at the session of Oct. 1, 1919.** Bol. R. Soc. Española Hist. Nat. 19: 429–430. Oct., 1919.—The President of the Society commented on certain species distributed as new in the last fascicle of Maire's "Mycotheca Boreali-Africana," particularly with reference to their relation to the mycological flora of Spain. *Puccinia Scirpi-littoralis* (Pat.) Maire, II, III. The species encountered on *Scirpus* in regions where there is no *Limnanthemum nymphoides* may be this new species; *P. Laguri-Chamaemoly* Maire, O, I–II, III, probably occurs in southern Spain where *Allium Chamaemoly* occurs; *P. madritensis* Maire, O, I–II, III, is probably the species reported as an aecidium on *Clematis cirrhosa* from the Balaeric islands and referred to *P. Agropyri* Ell. & Ev.; *Uromyces Cuenodii* Maire, II, III; *Entyloma Eryngii-triquetri* Maire, probably occurs in southern Spain; *Physoderma Ornithogali* Maire attacks *Ornithogalum narbonense* which occurs in all parts of Spain.—*O. E. Jennings.*

647. FRIES, THORE C. E. **Onygena equina (Willd.) Pers. funnen i Halland.** [Onygena equina (Willd.) Pers. found in Holland.] Svensk. Bot. Tidskr. [Stockholm] 13: 107. *Fig. 1.* 1919.

648. GUNN, W. F. **Some Irish Mycetozoa.** Irish Nat. 28: 45–48. 1919.—The number of Irish Mycetozoa should approximate those recorded from Great Britain and further exploration is desired. A list of thirty-eight species and varieties from new localities and one, *Hemitrichia vesparium*, new to Ireland is given.—*W. E. Praeger.*

649. HADDEN, N. G. **The Uredineae of West Somerset.** Jour. Botany 58: 37–39. 1920. —This paper is a list of the rusts found within a few miles of Porlock in Somerset, England. The list is said to contain an unusually large number of species, a number of which are rare and interesting. The nomenclature is that of Ramsbottom's list of British Uredinales.—*K. M. Wiegand.*

650. HARRIS, J. E. G. **Contributions to the biochemistry of pathogenic anaerobes. VIII. The biochemical comparison of microorganisms by quantitative methods.** Jour. Path. and Bact. 23: 30–49. *Fig. 1–2.* 1919.—See Bot. Absts. 5, Entry 936.

651. HERRE, A. W. C. T. **A list of lichens from southeastern Alaska.** Publ. Puget Sound Biol. Sta. 2: 279–285. 1919.—A taxonomic report on the lichens collected by the members of the U. S. Bureau of Soils Kelp Exploration Expedition to Southeastern Alaska in 1913. 86 species and varieties were collected, of which 19 were not previously known from Alaska. The range of others is extended.—*T. C. Frye.*

652. HERRMANN, E. **Behandlung und Untersuchung der Trockenpilze.** [Treatment and examination of mushrooms for drying purposes.] Pharm. Zentralhalle Deutschland 60: 5–7, 21–25. *Pl. 1, fig. 16.* 1919.—A description of edible fungi and tests for distinguishing these from poisonous fungi.—*H. Engelhardt.*

653. HOLLANDE, A. CH. **Formes levures pathogènes observées dans le sang d'Acridium (Caloptenus italicus L.).** [Pathogenic yeast forms observed in the blood of Acridium.] Compt. Rend. Acad. Sci. Paris 168: 1341–1344. *1 fig.* 1919.—MARCHAL has reported yeast forms in the blood of the caterpillars of *Cochylis*. It is probable that these are parasitic. Author in 1918 discovered a form of yeast in the blood of crickets (*Caloptenus italicus*). The normal limpid blood of the insect assumes a milky appearance when the insect is affected and death ensues. Disease was produced by injection of blood of diseased individuals into normal ones. It was possible to produce the disease in *Psophus stridulus L.* but in other forms experimented upon the yeast cells were rapidly destroyed by the leucocytes. Organism is described and figured. The organism was obtained in pure culture on various media and in certain cases filamentous forms have appeared. Author suggests two possibilities, viz., that a yeast and another fungus are present and secondly that the yeast form is merely one stage in the life cycle of a filamentous form. It is proposed to inoculate insects with both forms to settle this point.—*V. H. Young.*

654. KEISSLER, K. v. **Beiträge zur Naturgeschichte der Scoglien und Kleineren Inseln Suddalmatiens. 4. Fungi.** [The natural history of the smaller islands of southern Dalmatia. 4. Fungi.] Denkschr. K. Akad. Wiss. Wien. (Math.Nat. Kl.) 92: 299–300 1916.—Only six species are listed. These are *Diplodina Sandstedei*, *Didymosphaeria* sp., *Hysterium angustatum*, *Stictis radiata*, *Scutula Aspiciliae*, and *Leciographa centrifuga*.—*H. M. Fitzpatrick.*

655. KEMPTON, F. E. **Origin and development of the pycnidium.** Bot. Gaz. 68: 233–261. *6 pl.* Oct., 1919.—Pycnidia originate and develop by two main methods, meristogenous and symphyogenous, the meristogenous method resolving itself into two modes, simple and compound. Variations of the meristogenous method are found in *Coniothyrium pyriana* and *Sphaeronaemella fragariae*. The symphyogenous method is less often found and is variable. Acervuli arise as do pycnidia, simple acervuli by the simple meristogenous mode, and complex ones usually by the compound meristogenous or symphyogenous method. Complex subicles

usually arise symphyogenously, although they may arise by the compound meristogenous mode. Simple sporodochia usually originate by the simple meristogenous method. Complex sporodochia, with a large base or subicle, usually arise either by the compound meristogenous mode or symphyogenously. The pseudo-acervulus of the species of *Pestalozzia* studied arises and develops as a pycnidium which breaks open and appears like an acervulus. The simple meristogenous development is the one more often found in the Sphaeropsidales, while the compound meristogenous and symphyogenous modes are the more usual in the Melanconiales and Tuberculariaceae.—*F. E. Kempton.*

656. Lagerberg, Torsten. **Onygena equina (Willd.) Pers. från Dalarna.** [Onygena equina (Willd.) Pers. found in Dalarna.] Svensk. Bot. Tidskr. [Stockholm] 13: 108. *Fig. 1.* 1919.

657. Lendner, A. **Les mucorinées géophiles recoltées a Bourg-Saint-Pierre.** [The soil mucors collected at the village of St. Peter, Switzerland.] Bull. Soc. Bot. Genève 10: 362-376. *3 fig.* 1918.—Six cultures of *Mucor* which were obtained from the soil near St. Peter contained two new varieties and two new species. *Mucor Ramannianus* Moeller was frequently found in coniferous forests, sometimes on *Sphagnum* of peat bogs. *M. plumbens* Bonorden was common in the air and soil. *M. hiemalis* Wehmer (−) var. *albus* n. var produced occasional zygospores with the + strain of the species. *M. hiemalis* (+) var. *toundrae* n. var. differs from the species in its habit of growth in cultures. *M. Jauchae* n. sp. was isolated from the soil of a fir forest. *M. vallesiocus* n. sp. was obtained from the soil. of a meadow.—*W. H. Emig.*

658. Lettau, G. **Schweizer Flechten.** [Some lichens of Switzerland.] **Part I.** Hedwigia 60: 84–128. **Part II.** Hedwigia 60: 267–312. 1918.—An enumeration of the lichens and of some fungus-parasites of lichens, arranged by localities with critical notes. No new species are described.—*L. W. Riddle.*

659. Licent, Eug. **La forme ascophore du Clasterosporium fungorum (Fr.) Sacc. (Amphisphaeria fungorum n. sp. Eug. Licent.)** [The ascogenous form of C. fungorum (Fr.) Sacc.] Compt. Rend. Acad. Sci. Paris 170: 60–62. *1 fig.* 1920.—*C. fungorum* is transferred from the Mucedineae to the genus *Amphisphaeria* of the Ascomycetes. The author has discovered and describes the asci-containing perithecia which appear in November beneath the dark-colored conidiferous filaments of this fungus when growing upon the white fructifications of *Corticium calceum* Persoon or *C. lacteum* Fries as a host. These perithecia develop until they project almost entirely free from the conidial layer, attaining a diameter of 0.2 to 0.5 mm.—*C. H. and W. K. Farr.*

660. Magnusson, A. H. **Material till Västkustens Lavflora.** [Material for the Lichen Flora of the West Coast.] Svensk. Bot. Tidskr. [Stockholm] 13: 75–92. 1919.—The author gives a list of several hundred species of lichens found by him on the west coast and adjacent islands of Sweden together with brief notes on their habitat and abundance.—*W. W. Gilbert.*

661. Malme, Gust. O. A. **Lichenes suecici novi.** [New Swedish lichens.] Svensk. Bot. Tidskr. [Stockholm] 13: 26–31. 1919.—Author gives Latin descriptions of six new species of lichens of the genera *Lecidea, Catillaria,* and *Rhizocarpon.*—*W. W. Gilbert.*

662. McCulloch, Lucia. **Basal glume rot of wheat.** Jour. Agric. Res. 18: 543–551. *Pl. 62–63.* 1920.—See Bot. Absts. 5, Entry 749.

663. Merewschkowsky, C. **Note sur une nouvelle forme de Parmelia vivant à l'état libre.** [A new form of Parmelia living in an unattached condition.] Bull. Soc. Bot. Genève 10: 26–34. *1 fig.* 1918.—*Parmelia conspersa* (Ehrh.) Ach. forma *vaga* n. form occurs in abundance on a certain plateau with all the vegetative characteristics of a steppe. On the steppe, conditions for growth are unfavorable to the production of new lichen plants by the development of fungous spores and algal cells. As a consequence of the arid conditions this lichen does not have fruiting bodies but multiplies by the fragmentation of the thallus.—*W. H. Emig.*

664. Murrill, William A. **Corrections and additions to the polypores of temperate North America.** Mycologia 12: 6–24. 1920.—Since the publication of the polypores in the *North American Flora* much additional information has been obtained on this group involving clearer identity of some of the forms previously described and adding a number of species not previously listed. Various changes are accordingly made or suggested involving the reclassification of numerous forms.—*H. R. Rosen.*

665. Murrill, W. A. **Fungi from Hedgcock.** Mycologia 12: 41–42. 1920.—Twelve species of polypores collected by Hedgcock and others are listed.—*H. R. Rosen.*

666. Murrill, W. A. **Collecting fungi at Yama farms.** Mycologia 12: 42–43. 1920.—Describes an interesting collecting tour in a large tract of virgin land near Poughkeepsie, New York. Nearly 100 species of fungi were collected and several of the more interesting polypores and agarics are mentioned.—*H. R. Rosen.*

667. Murrill, W. A. **Trametes serpens.** Mycologia 12: 46–47. 1920.—American specimens referred to *Trametes serpens* Fr. are found to have smaller pores and are "otherwise distinct" from those of Europe. The distribution of the American plant is given and it is compared with a Philippine specimen, *Elmeriana setulosa*, which it seems to match.—*H. R. Rosen.*

668. Murrill, W. A. **The genus Poria.** Mycologia 12: 47–51. 1920.—Historical sketch of the genus *Poria* as used by mycologists before the time of Persoon together with Persoon's interpretation of the genus is presented. *P. medullapanis* (Jacq.) Pers., one of the species upon which Persoon based the genus, is thoroughly described, its variations noted and a large number of American collections of this species which were examined by the writer are listed.—*H. R. Rosen.*

669. Murrill, W. A. **Collecting fungi near Washington.** Mycologia 12: 51–52. 1920.—Brief notes of mycologists and of a few fleshy fungi seen during a collecting trip around Washington, D. C.—*H. R. Rosen.*

670. Northrup, J. H., Lauren H. Ashe, and R. R. Morgan. **A fermentation process for the production of acetone and ethyl alcohol.** Jour. Indust. Eng. Chem. 11: 723–727. *2 fig.* 1919.—The general characteristics of a new organism, *Bacillus acetoethylicum*, are given according to the descriptive chart of the Society of American Bacteriologists, but a formal diagnosis is postponed for a later paper. [See Bot. Absts. 4, Entry 1515.]—*B. M. Duggar.*

671. Olivier, H. **Les lichens pyrénocarpés de la flore d'Europe.** [**The pyrenocarpic lichens of Europe.**] Bull. Geog. Bot. **28:** 146–152, 168–183. 1918.—First two installments of a compilation of all the described genera, species, and varieties, of pyrenocarpic lichens of Europe, with keys and diagnoses. The two parts cited include the genera *Normandina*, and *Endocarpon* (taken in a broad sense), and the key to *Polyblastia*.—*L. W. Riddle.*

672. Paine, Sydney G., and W. F. Bewley. **Studies in bacteriosis. IV.—"Stripe" disease of tomato.** Ann. Appl. Biol. 6: 183–202. *Pl. 8–9, 5 fig.* 1919.—See Bot Absts. 5, Entry 756.

673. Paine, Sydney G., and H. Stansfield. **Studies in bacteriosis. III.—A bacterial leaf-spot disease of Protea cynaroides, exhibiting a host reaction of possibly bacteriolytic nature.** Ann. Appl. Biol. 6: 27–29. *Pl. 2, fig. 3–6.* 1919.—See Bot. Absts. 5, Entry 757.

674. Pethybridge, G. H., and H. A. Lafferty. **A disease of tomato and other plants caused by a new species of Phytophthora.** Sci. Proc. Roy. Dublin Soc. **15:** 487–503. *3 pl.* 1919.—See Bot. Absts. 4, Entry 1335.

675. Pfeiler, W., and F. Engelhardt. **Zeigt der Ferkeltyphus-Bacillus (Bac. Voldagsen Dammann und Stedefeder) ein Labiles biochemisches und agglutinatorisches Verhalten?** [Does the Ferkel typhus bacillus (Bac. Voldagsen Dammann und Stedefeder) show a labile biochemical and agglutination relation?] Zeitschr. Immunitätsforsch. u. exp. Therapie 28: 434–445. 1919.—The authors show that *Bac. Voldagsen* Damm. & Stedef. is distinct from the other members of the paratyphosus group and that it does not approach the characters of the group on long continued cultivation on artificial media—*C. W. Dodge.*

676. Plitt, Charles C. **A short history of lichenology.** Bryologist 22: 77–85. 1919.

677. Puyhaubert, A., and R. Jolly. **Note sur un cas de mycètome à grains noirs provoqué par un champignon du genre Madurella.** [Notes on a case of mycetoma with black granules, caused by a fungus of the genus Madurella.] Arch. Méd. Exp. et Anat. Path Paris 28: 441–445. *5 fig.* 1919.—A skin disease of a native of the Ivory Coast was shown to be due to infection with a fungus probably identical with *Madurella mycetomi* (Laveran) Brumpt. The fungus grown in pure culture on carrot gave abundant mycelium with numerous small black sclerotia, but no spores.—*E. A. Bessey.*

678. Rick, J. **Contributio II ad monographiam agaricinorum brasiliensium.** [Second contribution to a monograph of Brazilian agarics.] Broteria Ser. Bot. 17: 101–111. 1919.—The article is a sequel to one published in Broteria for 1905. After briefly outlining difficulties of study, the author lists 92 species or varieties mostly collected in the vicinity of Parecy Novo. Notes upon spore measurements, color, appearance, and habitat, based upon fresh material, accompany some of the species. *Tricholoma sulphurellem, Clitocybe nauseosa, Collybia sericea, Mycena sulphureo-conspersa, Leptonia rosea, L. straminea, L. albo-serrulata, L. olivacea, L. fuligineo-straminea, Pholiota pusilla, P. rosea, Inocybe megalospora, Psalliota haemorrhoidaria var. straminea,* and *Schizophyllum album* are proposed as new. Note is made that *Lactarius Russula* as previosly reported by the author is probably *L. trivialis.*—*Edward B. Chamberlain.*

679. Robertson, W. F. **A starch-splitting bacterium found in cases of diabetes mellitus.** Jour. Path. and Bact. 23: 122–123. 1919.

680. Romell, L. **Svamplitteratur, särskilt för studium av hymenomyceter [hattsvampar).** [Mycological literature, especially for the study of the hymenomycetes (hat fungi).] Svensk. Bot. Tidskr. [Stockholm] 13: 110–112. 1919.—A list of European literature on the hymenomycetes and related fungi is given comprising thirty titles.—*W. W. Gilbert.*

681. Rosen, H. R. **Ergot on Paspalum.** Mycologia 12: 40–41. 1920.—*Paspalum floridanum* is recorded as a new host for *Claviceps* spp. It is noted that attacked spikelets fall with pedicels attached to them in contrast to the fall of normal spikelets in which the pedicels remain attached to the rachis.—*H. R. Rosen.*

682. Seaver, Fred J. **Photographs and descriptions of cup-fungi—VIII. Elvela infula and Gyromitra esculenta.** Mycologia 12: 1–5. *Pl. 1.* 1920.—Comparison between descriptions and illustrations of *Elvela (Helvella) infula* and *Gyromitra esculenta* leads the writer to believe that these names are referable to the same fungus. Differences noted by various authors are explainable as variations. The name *Elvela infula* Schaeff. is adopted because of its priority; 11 synonyms are listed and the plant is redescribed and illustrated.—*H. R. Rosen.*

683. Sernander, R. **Subfossile Flechten.** Flora 112: 703–724. *7 fig.* 1918.

684. Speare, A. T. **Further studies of Sorosporella uvella, a fungous parasite of noctuid larvae.** Jour. Agric. Res. 18: 399–439. *Pl. 51-56.* 1920.—*Sorosporella uvella* is recorded for America. It is found to be related to the verticillaceous hyphomycetes rather than to the Entomophthorales. It produces chlamydospores and thin-walled conidia. Yeast-like vege-

tative cells, occurring in the blood of infected insects, are ontogenetically related to other phases in the development of the organism. Fruiting structures of the Isaria type have been observed in culture and in moist chamber. An ascigerous stage has not been observed. An emended description is presented.—The organism produces a disease of noctuid larvae (cut worms) and in infection experiments a mortality of from 60 to 90 per cent was obtained.—Ingestion of vegetative cells by phagocytes was observed, the process being followed apparently by the destruction of the phagocytes. Phagocytosis is discussed at some length, also certain phases of insect control by means of fungous parasites.—A bibliography of 24 titles is appended.—*D. Reddick.*

685. Stevens, F. L. **Three new fungi from Porto Rico.** Mycologia 12: 52–53. 1920.—The following fungi collected by the writer and briefly described by Mr. Lamkey are presented: *Microstoma ingaicola* Lamkey sp. nov. producing witches' brooms on *Inga laurina*, *M. pithecolobii* Lamkey sp. nov. producing spots on *Pithecolobium saman*, and *Perenoplasmopara portoricensis* Lamkey sp. nov. producing spots on *Melia azedarach.*—*H. R. Rosen.*

686. Stevens, F. L., and Nora Dalbey. **A parasite of the tree fern (Cyathea).** Bot. Gaz. 68: 222–225. *2 pl.* Sept., 1919.—A fungus collected on *Cyathea arborea* in Porto Rico has characters suggesting relationship with Microthyriaceae, Perisporiaceae, Dothidiaceae, and Phacidiaceae; the authors incline to place it in the last-named group, proposing for it a new generic name, *Griggsia.* The type species is described as *Griggsia cyathea.*—*H. C. Cowles.*

687. Strasser, P. Pius. **Siebenter Nachtrag zur Pilzflora des Sonntagberges (N.-Ö.) 1917.** [7th addition to the fungus flora of Sonntagberg.] Verhandl. Zool.-Bot. Gesell. Wien. 68: 97–123. 1918.—A list of species is given accompanied by the data of collection and critical notes. The material was in most cases examined by von Höhnel and a considerable number of species and a few genera are listed as new and are attributed to him. Some of these have been published elsewhere by von Höhnel but others are designated here as unpublished, the binomial being followed by the citation "v. H. nov. spec. in litt." These fall in many groups of the fungi but since technical descriptions of these will be given elsewhere by von Höhnel they need not be listed here.—*H. M. Fitzpatrick.*

688. Takahashi, R. **On the fungous flora of the soil.** Ann. Phytopath. Soc. Japan 1²: 17–22. 1919.—The author isolated several fungi from the soil of the test garden of the Tokyo Imperial Agricultural College by using soil extract gelatin-agar (+60, Fuller's scale). The isolation is made at two different periods, the one in September, 1915, and the other in February, 1916. The result of the experiments is listed as follows: In 1915 (a) In the soil obtained from 2 cm. below the surface: *Mucor racemosus*, *Aspergillus oryzae*, *A. fumigatus*, *Penicillium roseum*, *P. candidum*, *P.* sp. No. 1., *Chaetomium crispatum*, *Stemphylium verruculosum*, and *Penicillium* sp. No. 2.; (b) 5 cm. below the surface: *Aspergillus fumigatus*, *A. niger*, *Penicillium humicola*, *P. candidum*, *Allescheriella nigra*, *Acrostalagmus* sp., and *Helminthosporium subulatum*; (c) 8 cm. below the surface: *Aspergillus fumigatus* and *Trichoderma Koningi*; (d) 12 cm. below the surface: *Penicillium Duclauxi*, *Penicillium* sp. No. 2, *Chaetomium alivaceum* and *Alternaria tenuis.* In 1916 (f) 2 cm. below the surface: *Rhizopus nigricans*, *Aspergillus oryzae*, *A. niger*, *A. glaucus* and *A. nidulans*; (g) 8 cm. below the surface: *Mucor adventitus*, *M. circinelloides*, *Zygorhynchus Möllcri*, *Rhizopus nigricans* and *Botrytis cinerea.*—*T. Matsumoto.*

689. Tanaka, Tyôzaburô. **New Japanese fungi-notes and translations—VIII.** Mycologia 12: 25–32. 1920.—The following fungi are described: *Phytophthora Carica* (Hora) Hori causing a fruit rot of *Ficus Carica*, *Capnodium Tanakae* Shirai and Hora sp. nov. saprophytic on fruits of *Citrus grandis*, *Glocosporium foliicolum* Nishida sp. nov. causing a spotting of fruits and leaves and a blighting of twigs of *Citrus* spp., *Dactylaria Panici-paludosi Sawada* sp. nov. on living leaves of *Panicum paludosum*, *Dactylaria Leersiae* Sawada sp. nov. on living leaves of *Leersia hexandra* and *Dactylaria Costi* Sawada sp. nov. on living leaves of *Costus speciosus.*—*H. R. Rosen.*

690. Tsuji, R. **On the morphology and the systematic position of Cercosporella persica Sacc. and Clasterosporium degenerans Syd.** (Japanese.) Ann. Phytopath. Soc. Japan 1[2]: 23–35. *Fig. 1–2.* 1919.—A fungus found on the leaves of a peach tree in Japan proved to be identical with *Cercosporella persica* Sacc. collected on a similar host and determined by W. G. Farlow in the United States. This fungus is closely related to *Clasterosporium degenerans* Syd. on the leaves of *Prunus Mume* and *Armeniaca*, in that its conidiophores are produced on creeping hyphae emerging from stomatal openings, and also in color, shape, and mode of septation of their conidia, etc. He comes to the conclusion that these two species should be included under the same genus, and the name *Clasterosporium persicum* (Sacc.) Tsuji is proposed for the first-named species.—*T. Matsumoto.*

691. Vuillemin, Paul. **Remarques sur les mycétomes. Hommage à la mémoire de R. Jolly.** [Remarks on mycetomas. Tribute to the memory of R. Jolly.] Arch. Méd. Exp. et Anat. Path. Paris 28: 446–451. 1919.—Gives a discussion of the different types of mycetomes and of the fungi producing them, in particular *Madurella mycetomi* (Laveran) Brumpt.—*E. A. Bessey.*

692. Waksman, Selman A. **Cultural studies of species of Actinomyces.** Soil Sci. 8: 71–215. *Pl. 1–4.* 1919.—See Bot. Absts. 5, Entry 998.

693. Watson, W. **The bryophytes and lichens of calcareous soil.** Jour. Ecol. 6: 189–198. 1918.—Gives lists of calciphile and calcifuge species, arranged by habitats as they occur in England; also a list of "indifferent" species. [See Bot. Absts. 4, Entry 309.]—*L. W. Riddle.*

694. Weimer, J. L. **Variations in Pleurage curvicolla (Wint.) Kuntze.** Amer. Jour. Bot. 6: 406–409. 1919.—Variation in this species was studied to determine the taxonomic value of certain characters. The number of spores in the ascus is apparently 128, 256, or 512. The spore size in the strain studied is approximately the same as that recorded for other strains of the species, but the size of the perithecia is somewhat more variable. Secondary spore appendages, supposed to be a constant taxonomic character for the species, were not demonstrated.—*E. W. Sinnott.*

695. Weimer, J. L. **Some observations on the spore discharge of Pleurage curvicolla (Wint.) Kuntze.** Amer. Jour. Bot. 7: 75–77. 1920.—Author reports that this species is able to discharge its spores to a height of 45 cm. above the fruiting surface of the culture, probably higher than can any other Ascomycete yet studied. This is due in part to the fact that the spore mass discharged is rather large and heavy, comprising some 500 spores and a quantity of gelatinous substance. Experiments show that the spore discharge is strongly and positively heliotropic, but that reflected light seems to exert a stronger stimulus than does direct light.—*E. W. Sinnott.*

696. Weston, William H. **Repeated zoospore emergence in Dictyuchus.** Bot. Gaz. 68: 287–296. *1 pl., 1 fig.* Oct., 1919.—The non-sexual reproduction of the fungus studied shows it to be a species of *Dictyuchus*, but exact determination was impossible, because sexual reproduction was not observed. *Dictyuchus* differs from all other Saprolegniaceae, save perhaps *Aplanes*, in that during spore formation the walls of adjacent spores unite with one another and with the enveloping sporangium membrane to form a polygonally chambered indehiscent structure. The zoospores which emerge from the sporangiospores come to rest and encyst as usual, but from these encysted spores ("cystospores") in turn laterally biciliate zoospores may emerge. This repeated emergence of laterally biciliate zoospores has not previously been reported in any of the Saprolegniaceae.—*H. C. Cowles.*

697. Wheldon, J. A. **Llanberis lichens.** Jour. Botany 58: 11–15. 1920.—A list of lichens compiled in the district around Llanberis in August, 1919. Many lichens known to occur in this district were not seen, while some rare species were observed. Few corticole species were collected as most of the time was spent above tree line. The arrangement is

that of A. Lorrain Smith's British Lichens. The list contains the names of about 125 species and a number of varieties. One species, *Bilimbia cambrica*, is described as new.—*K. M. Wiegand.*

698. Wilson, G. H. A method for the simultaneous demonstration of gram-positive and gram-negative organisms in sections. Jour. Path. and Bact. 23: 123–124. 1919.

699. Winslow, C. E. A., I. J. Kligler, and W. Rothberg. Studies on the classification of the colon-typhoid group of bacteria with special reference to their fermentative reactions. Jour. Bact. 4: 429–503. 1919.—The authors review rather completely the literature of the colon-typhoid group and arrange the whole series into six groups based mainly upon their fermentation of various carbohydrates. Several cultures are studied and classified. Seventeen species are included in the entire six groups and characteristics of each species given. The commonly called *B. paratyphosus A* is designated as *B. paratyphosus* and *B. paratyphosus B.* as *B. schottmulleri*, a new name; the name *B. morgani* is given to the formerly-called Morgan bacillus.—*Chester A. Darling.*

700. Yasuda, A. Kinrui-Zakki 87. [Notes on fungi, 87.] Bot. Mag. Tokyo 33: 112–114. 1919.—Three species of *Hymenomycetes* found in Japan *Stereum boninense*, *Hydnum violascens*, and *Tomentella fusca*, are reported. The first-named species was first described by the author under the name *Hymenochaete boninensis* Yasuda. [See Bot. Absts. 4, Entry 1196.]—*T. Matsumoto.*

701. Yasuda, A. Kinrui-Zakki 88. [Notes on fungi, 88.] Bot. Mag. Tokyo 33: 140–141. 1919.—Three species of *Hymenomycetes* found in Japan, *Polyporus Greenii*, *Stereum rimosum*, and *Clavaria amethystina*, are reported, of which the first-named species is new to science, its morphological characters being as follows: Pileus stipitate, corky, brown, covered with fine hairs, circular in outline 4 to 5 cm., slightly convex, triangular in section, azonate, context brown, thick, mouths grayish brown, angular, 1 to 2 mm.; spores light brown, ellipsoid, smooth, 8–9×5–5.5μ; stipe 2 to 3.5 cm. high, 1.1 to 1.5 cm. in diameter, slightly narrowed at the base, concolorous with the pileus, covered with fine hairs. Growing on the ground, Settsu, Japan. [See Bot. Absts. 4, Entry 1197.]—*T. Matsumoto.*

702. Yasuda, A. Kinrui-Zakki 89. [Notes on fungi, 89.] Bot. Mag. Tokyo 33: 167–169. 1919.—Three species of *Hymenomycetes* found in Japan, *Polystictus scopulosus*, *Coniophora arida*, and *Hypocrea citrina*, are reported. The first-named species is new to science; morphological characters as follows: Sporophore stipitate, coriaceous, 6.5 to 9 cm. high; pileus thin, fan-shaped, 4.5–6 cm. in length, 5 cm. in width, margin irregularly waved, chestnut brown, covered with depressed scales, context whitish; stipe short, lateral, smooth, yellowish; mouths grayish, tubes short, angular, 0.2 to 0.3 mm.; spores ellipsoid, smooth, light brown, 7 by 5 μ. Growing on the stem of Alnus sp. [See Bot. Absts. 4, Entry 1198.]—*T. Matsumoto.*

703. Yasuda, A. Kinrui-Zakki 90. [Notes on fungi, 90.] Bot. Mag. Tokyo 33: 189–191. 1919.—Three species, namely *Stereum japonicum*, *Chaetosphaeria tristis*, and *Lycoperdon spadiceum*, are reported. The first-named species is new to science; morphological characters as follows: Fructification ruspinate, coriaceous, 8 to 15 cm., hymenial layer light brown, velvety, upper part of context concolorous with the hymenium, lower part grayish brown, cystidia club-shaped, light brown, encrusted with crystals of calcium oxalate; spores spherical, hyaline, smooth, 4 μ. Growing on stems.—*T. Matsumoto.*

704. Zahlbruckner, A. Beiträge zur Naturgeschichte der Scoglien und Kleineren Inseln Süddalmatiens. 5. Lichenes. [The natural history of the smaller islands of southern Dalmatia. 5. Lichens.] Denkschr. K. Akad. Wiss. Wien. (Math.-Nat. Kl.) 92: 301–322. 1916.—New species are described and various nomenclatorial changes are made in the genera, *Verrucaria*, *Dermatocarpon*, *Arthonia*, *Arthothelium*, *Roccella*, *Lecanactis*, *Lecidea*, *Gyalecta*, *Pertusaria*, *Lecanora*, *Ramalina*, *Proteblastenia*, *Caloplaca*, *Xanthora*, *Buellia*, *Rinodina*. One hundred and twenty-six species are listed.—*H. M. Fitzpatrick.*

705. Zschacke, H. **Die mitteleuropaeischen Verrucariaceen.** [The Verrucariaceae of central Europe.] Hedwigia 60: 1–9. 1918.—Two earlier papers with the same title have been published. The present paper is based on collections made in Switzerland, while the author was interned. An enumeration of species is given with citations of localities and some critical notes. *Staurothele geoica* is described as a new species.—*L. W. Riddle.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. Berry, *Editor*

706. Barett, A. **Contribution to the study of the "Siphoneae verticillatae" of the Calcare di Villanova-Mondovi.** [The verticillate Siphoneae of the Villanova-Mondovi limestone.] Atti Soc. Ital. Sci. Nat. e Mus. civ. St. Nat. Milano 58: 216–236. 1919.—The "Calcare di Mondovi" typically exposed—as the name indicates—in the region of Mondovi (Piedmont) and in particular in the massif of Villanova a few kilometers from the town, is rich in diminutive triassic algae, which, about 1865, Prof. Bruno recognized for the first time there. Different specimens of like fossils were studied by Gümbel and by Zittel who referred them to the Muschelkalk and the Wettersteinkalk horizons. For this work Barett examined some specimens of the Calcare di Villanova at the Museo Geologico di Torina, sent by Prof. Bruno, and especially the abundant material of his own collecting not only from Villanova, but also from other localities of the surrounding calcareous zone: M. Calvario, Gravagna, Moline and Torre, Peveragno. Material of different appearance according to the source or origin, but always crystalline, so that the fossils, although superficially seemingly well preserved are profoundly metamorphosed in the interior, rendering their preparation and study most difficult. Barett recognized the presence of the following Diploporidi in the Calcare di Mondovi: *Kantia debilis* Gümbel, *K. philosophi* Pia, *K. dolomitica* Pia, *Teutlosporella gigantea* Pia, *T. hercules* Sapp., *T. vicetina* Tornquist, and in addition the following, which he proposes as new: *Kantia philosophi* var. *gracilis* n. var., *K. monregalensis* sp. n., and *K.* (?) *Brunnoi* sp. n. He describes and figures them all.—Despite the great number of specimens examined, their different origins or sources, and the extraordinary abundance of the individuals contained in them, this study, because of the above-mentioned difficulty, has not yielded as great results as might have been hoped; nevertheless from this it stands proved that in the Calcare di Mondovi there are also encountered the *Kantia philosophi* and *dolomitica* typical of the Muschalkalk, and the *Teutlosporella gigantea* and *T. vicentina*, hitherto not noted; and there results then the confirmation that the horizon is to be referred to the lower Neotriassic.—*R. Pampanini.*

707. Benson, M. **Cantheliophorus, Bassler: New records of Sigillariostrobus (Mazocarpon).** Ann. Botany 34: 135–137. 1920.—Evidence is given to show that specimens described by Bassler as proving the existence of a sporangiophoric lepidophyte and referred to a new genus *Cantheliophorus*, as well as similar specimens previously described by Nathorst, are really examples of Sigillarian microsporophylls.—*W. P. Thompson.*

708. Berry, E. W. **The evolution of flowering plants and warmblooded animals.** Amer. Jour. Sci. 49: 207–211. Mar., 1920.—Discusses the correlation between the two and the dependence of the latter on the former.—*E. W. Berry.*

709. Bertrand, Paul. **Les zones vegetales du terrain houiller du Nord de la France.** [Plant zones of the coal regions of Northern France.] Compt. Rend. Acad. Sci. Paris 168: 780–782. 1919.—A table of the location and vertical extent of the plant zones in the coal deposits of Northern France.—*F. B. Wann.*

710. Cockerell, T. D. A. **Carpolithes macrophyllus a Philadelphus.** Torreya 19: 244. 1919.—*Carpolithes macrophyllus* Ckll., described in Torreya 11: 235, is transferred to *Philadelphus*, but very likely belongs to *P. palaeophilus* Ckll. (1908).—*J. C. Nelson.*

711. Conklin, E. G. **The mechanism of evolution.** [1] Sci. Monthly **10**: 170–181. 1920.—This is a discussion of Mendelism in which the author concludes that the law, especially as regards the segregation of inheritance factors, is of universal occurrence—that there is no other type of inheritance. Alternative inheritance with dominant and recessive characters, purity of germ cells, monohybrids, dihybrids, etc., factorial theory of heredity, blending inheritance, species hybrids, and unequal reciprocal hybrids are discussed in relation to the above conclusion. [See also next following Entry, 712.]—*L. Pace.*

712. Conklin, E. G. **The mechanism of evolution.** [2] Sci. Monthly **10**: 269–291. *Fig. 11–21.* 1920.—This paper takes up the cellular basis of ontogeny and phylogeny. There is no fundamental difference between germ cells and somatic cells. Nucleus and cytoplasm are fundamentally different chemically, morphologically and physiologically.—Mitosis furnishes the necessary mechanism for the accurate division of the cell, and the persistent identity of the chromosome is accepted. The suggestion is made that chromomeres are probably much more constant than chromosomes.—The mechanism of heredity is to be found in the germ cells. Genetics and cytology must cooperate in correlating features of the germ cell with the phenomena of heredity. The similarity of chromosomes of the spermatozoon and of the egg, the reduction division, the doubling of chromosomes in fertilization, the sex-chromosomes, sex-linked characters, linkage of characters, chromosomal localization and cross-overs are all presented as favoring the localization of the genes in the chromosomes. [See also next preceding Entry, 711.]—*L. Pace.*

713. Coulter, J. M. **Cones of Williamsonia.** [Rev. of: Arber, E. A. Newell. **Remarks on the organization of the cones of Williamsonia gigas.** Ann. Botany 33: 173–179. *5 fig.* 1919. (See Bot. Absts. 3, Entry 1143).] Bot. Gaz. **68**: 152. 1919.

714. Grandori, Luigia. **Su di un seme mesozoico di pteridosperma e sulle sue affinità con forme paleozoiche e forme viventi.** [**On a Mesozoic pteridosperm seed and its affinities with Paleozoic and recent forms.**] Atti d'Accad. Veneto-Trentino-Istriana. **8**: 107–116. *3 fig., 1 pl.* 1915.

715. Grandori, Luigia. **Sulle affinità delle Pteropsida fossili, studio critico.** [**On the affinities of the fossil Pteropsida.**] Atti d'Acad. Veneto-Trentino-Istriana **8**: 163–195. *7 fig.* 1915.

716. Knowlton, F. H. **A dicotyledonous flora in the type section of the Morrison formation.** Amer. Jour. Sci. **49**: 189–194. Mar., 1920.—Records the presence of an Upper Cretaceous flora similar to that of the Dakota sandstone from the type locality of the Morrison formation near Golden, Colorado. The Morrison formation has yielded a varied dinosaur fauna and there has been much controversy as to whether it was of Jurassic or Lower Cretaceous age.—*E. W. Berry.*

717. Principi, Paolo. **Le Dicotiledoni fossili del giacemento oligocenico di Santa Giustina e Sassello in Liguria.** [**The fossil dicotyledons of the Oligocene of Santa Giustina and Sassello in Liguria.**] Mem. Desc. Carta Geol. d'Italia **6**: 1–294. *Pl. 1–85.* 1916 (1919). —Liguria is one of the classic regions of Tertiary geology. The Oligocene of Sta. Giustina and Sassello record the transition from continental to delta and then lagoonal or estuary to littoral conditions of deposition followed by a recurrence of lagoonal conditions at the base of the middle Oligocene and littoral again at the top of the middle Oligocene. The fossil plants which are the subject of the memoir come from the basal beds or Sannoisian stage. Previous accounts of this flora have been published by Sismonda in 1859 and 1865, and Squinabol in the period from 1889 to 1892 described the Cryptogams, Gymnosperms and Monocotyledons.—The dicotyledons recorded number 339 forms, the most varied genera being Quercus Juglans, Myrica, Ficus, Laurus, Cinnamomum, and Rhamnus. Eighty-six new species are described in the following genera: Castanea, Dryophyllum, Quercus, Juglans, Juglandophyllum, Myrica, Comptonia, Populus, Protoficus, Ficus, Artocarpidium, Artocarpus, Cocculites,

Cocculus, Laurus, Persea, Cinnamomum, Magnolia, Anona, Sterculia, Dombeyopsis, Pterospermites, Bombax, Sapindus, Malpighiastrum, Celastrus, Rhamnus, Aralia, Dewalquea, Cornus, Terminalia, Lomatia, Amelanchier, Prunus, Machaerium, Aristolochia, Chrysophyllum, Diospyros, Apocynophyllum, Alstonia, Viburnum and Carpites.—The flora shows a curious mingling of temperate and tropical types and contains very many more of the former than does the known North American floras of corresponding age.—*E. W. Berry.*

718. Sahni, B. **On certain archaic features in the seed of Taxus baccata, with remarks on the antiquity of the Taxineae.** Ann. Botany 34: 117–134. *7 fig.* 1920.—See Bot. Absts. 5, Entry 574.

719. Schlagintweit, O. **Weichselia Mantelli im nordöstlichen Venezuela.** [Weichselia Mantelli in northeast Venezuela.] Centralb. Min. Geol. Paläont. 1919: 315–319. 1919.—Records this ubiquitous Mesozoic fern from Santa Maria, Venezuela, in a shale thought to be Neocomian in age.—*E. W. Berry.*

720. Small, James. **The origin and development of the Compositae. Miscellaneous topics.** New Phytol. 18: 129–176. *Fig. 64–78.* 1919.—This is chapter 12, in which miscellaneous topics are presented. A table of known fossil remains of Compositae and their localities is accompanied by critical notes and comments. The composites are believed to have arisen in late Cretaceous or early Eocene. From the point of origin in the northern Andean region of South America, migration occurred chiefly along mountain ranges. By the end of the Eocene the differentiation of types and wide dispersal was accomplished.—A summary of cytology, with original figures based on *Senecio*, follows. Spermatogenesis, oogenesis, and the history of the embryo sac are discussed, with a special account of the antipodals. The chromosomes are treated from the standpoint of phylogeny. A table is given of the number in all composites so far as known.—The nature and distribution of the latex system in the tribes are discussed.—Last are brief accounts of seedling structure, pericarp, anatomy, phytochemistry, and pappus in the Compositae.—The bibliography contains 173 titles.—*I. F. Lewis.*

721. Small, James. **The origin and development of the Compositae. General conclusions.** New Phytol. 18: 201–234. *Fig. 79.* 1919.

722. Stopes, Marie C. **New Bennettitean cones from the British Cretaceous.** Phil. Trans. Roy. Soc. London B, 208: 389–440. *5 pl.* 1918.—Bennettites albianus, sp. nov., is described from a cone found in the Gault (or Albian) of Folkestone Warren. The fruit is an ovulate cone, not less than 70 mm. in diameter and probably much more. The innumerable seeds, 600 or more revealed in a single transverse section, are five-ribbed, much elongated, torpedo-shaped, 5–6 mm. long and about 1.2 mm. in greatest diameter. The seed with its many layered integument is inclosed in a cupule-like extension of tubular cells of the stalk. The micropyles are blocked by plugs of nucellar tissue. Around the apex of the seed, interseminal scales are completely mutually fused not only with each other but with the seed tissues. The embryos contain two cotyledons and both the radicle and the hypocotyl are relatively massive. The scales are externally covered by a well marked "plastid layer" which runs around the collar of the micropyle.—The complete fusion of the stony scales must have meant that there was great stability and strength in the hard, uniform shell which surrounded the fruit. This solid shell firmly enclosed the ripe seeds, which did not rattle about in it loose, for the ribbed apices of the seeds were wedged into the solid mass. It is not impossible that the hard fruit had considerable drought to withstand. It certainly seems fitted to do so.—The extraordinarily great size of Bennettites albianus raises a point of general interest. In many families of animals giant forms appear shortly before the extinction of the group. This new Bennettites possesses the largest cone of the family and was taken from the highest and latest geological horizon in which the group is known. May it then be considered in the same light as the animal giants—namely a burst of glory before extinction? Any conclusion on this point, no matter how tempting, must not be accepted too readily. A giant fruit in many

of the cycadales may be borne on small plants. The giantism of the animals approaching extinction was not in their reproductive organs but in their general bodies. The comparison with animals is, therefore, insecure and rests on too many assumptions. Paleobotanical evidence is made up of too few isolated cases to point a general law of evolution.—Bennettites maximus Carruthers is also figured and described in detail for the first time. The only specimen of this is from the lower Greensand in the Isle of Wight. This specimen consists of a large trunk containing a number of cones. Sections made of this trunk show a number of cones. These are bisporangiate. The male organs were developing at the time the plant was petrified. The female receptacle was at that time undifferentiated, meristematic tissue. Sections have been made, however, of one cone showing the ovule rudiment and the surrounding tissue.—*A. E. Waller.*

723. Stopes, Marie C. **On the four visible ingredients in banded bituminous coal: Studies in the composition of coal, No. 1.** Proc. Roy. Soc. London B, 90: 470–487. *Pl. 11–12.* 1919.—Proposes names fusain, durain, clarain, and vitrain for four recognizably distinct ingredients of banded bituminous coal. These types are distinctive (a) in effect on sensitive plates (b) chemical and physical behaviour (c) in microscopic details.—*Paul B. Sears.*

724. Wilson, W. J. **Notes on some fossil plants from New Brunswick.** Geol. Surv. Canada, Summary Rept. 1917 F: 15–17. 1918.—Publication of identifications and notes on specimens and photographs submitted to Robert Kidston. The material came from the Carboniferous of Rothwell, New Brunswick.—*E. W. Berry.*

PATHOLOGY

G. H. Coons, *Editor*

C. W. Bennett, *Assistant Editor*

725. Anonymous. **Celery leaf-spot disease or blight.** Jour. Dept. Agric. Ireland 20: 86–89. *3 fig.* 1920.

726. Anonymous. **A new disease of pears, new to the continent of America.** Agric. Gaz. Canada 6: 951–952. *4 fig.* Oct., 1919.—Specimens of pears received by the Division of Botany, Dominion Department of Agriculture, from Kentville, Nova Scotia, showed an unusual rot. Nearly full grown pears showed one or more large, circular, dark-brown spots which were quite firm in texture. *Phytophthora cactorum* was obtained in culture from the spots. Only the fruit upon the low hanging branches showed the disease, which suggests that the infection may originate from surrounding infected vegetation. Control measures, chiefly prophylactic are suggested.—*O. W. Dynes.*

727. Appel, Otto, and Johanna Westerdijk. **Die Gruppierung der durch Pilze hervorgerufenen Pflanzenkrankheiten. [The classification of plant diseases due to fungi.]** Zeitschr. Pflanzenkrankh. 29: 176–186. 1919.—The authors point out the advantages of a classification based upon symptomology, particularly to students of phytopathology. They suggest five main groups, viz.: rots, spots, fungus coverings, increase of tissues, and vascular diseases. Each main group is divided into auxiliary groups, thus: "Rots," for instance, is subdivided into rot of seeds, of seedlings, of roots, of tubers, of bulbs, of rhizomes; basal stem rots; general stem rots; rots of buds and flowers, of fruits, of wood, of bark; and dry rots. The group "Increase of tissues" covers witches' brooms, galls, and flower and fruit transformations (ergot, smuts, etc.). Each group is discussed, reviewing examples.—*H. T. Güssow.*

728. Baker, C. F. **A contribution to Philippine and Malayan technical bibliography. Work fundamental to plant pathology and economic entomology.** Philippine Agric. 8: 32–37. 1919. See Bot. Absts. 5, Entry 1238.

729. Barre, H. W. **Report of the division of botany.** South Carolina Agric. Exp. Sta. Ann. Rept. 32: 29–34. 1919.—A summary of the work on the following projects is given: Cotton anthracnose, angular leaf spot of cotton, bacterial content of milk, plant disease survey, coöperative research.—*G. H. Coons.*

730. Blin, H. **La pourriture des griffes d'asperges.** [Asparagus root-rot.] Rev. Hortic. 91: 325–326. *1 fig.* Aug., 1919.—This disease is due to *Rhizoctonia violacea* which attacks many other types of plants. All portions of asparagus plants which are attacked should be carefully dug up and burned. The soil should then be disinfected with carbon-bisulfide (about 250 grams per square meter) or preferably formaldehyde (about 60 grams per square meter). Either of these should be forced into the soil at several places with a syringe. Sulfocarbonate of potassium (300 grams in 100 liters of water) has also been used successfully. The soil is first removed from the hills which have been attacked and these are then sprayed lightly with the mixture. The following year, before hilling-up a second treatment is given. Before replanting infected areas they should be thoroughly disinfected during the winter and the clumps dipped in the disinfecting solution. Following any of these treatments the soil should be well fertilized, since the disinfection destroys the soil organisms present. Care should be taken to avoid such disinfectants as may leave harmful residues in the soil treated. As a matter of precaution, it is better not to replant infected areas for 2 or 3 years.—*E. J. Kraus.*

731. Boas, Friedrich. **Beiträge zur Kenntnis des Kartoffelabbaues.** [Contribution to the knowledge of deterioration in potatoes.] Zeitschr. Pflanzenkrankh. 29: 171–176. 1919.—The author states that minute differences in the hydrogen-ion concentrations may have marked effects upon metabolic processes.—This caused him to inquire whether, in plant diseases, especially in leaf roll or curly disease of potatoes, there could be determined any differences in the hydrogen-ion concentrations existing in sound and diseased plants.—He ascertained from his experiments (describing technique employed) that, without exception, the cell sap of sound plants showed appreciably more acidity than that of diseased plants. The acid metabolism of diseased plants is plainly disturbed. In determining the albumen metabolism that might be expected under the circumstances, author determines that the diseased potato stems are flooded with amino acids, while the sound tissues are free, or only show traces of these acids. Examining then into the catalase contents of diseased and sound plants, he finds obvious differences in his experimental varieties, inasmuch as the diseased portions show an increase in catalase contents over the sound ones; but not all experiments gave identical results. (Bibliography.)—*H. T. Güssow.*

732. Chou, Chung Ling. **Notes on fungous diseases in China.** (Text in Chinese.) Khu Shou [Science-Publication of The Chinese Science Society] 4: 1223–1229. *46 fig.* 1919. —The author gives a detailed description of symptoms and morphology of fifteen fungous diseases found in the locality of Nanking: *Peronospora parasitica* on *Brassica juncea*, *Peronospora effusa* on spinach, *P. vicae* on peas, *P. schleideniana* on onion leaves, *Alternaria brassicae* on *Brassica pekinensis*, *Cercospora cruenta* on beans, *Ustilago crameri* on wheat, *U. avenae* on oats, *Urycystis tritici* on wheat, *Ustilago shiriana* on bamboo, *Erysiphe graminis* on barley, *Pleospora gramineum* on barley, *Exoascus deformans* on peach leaves, *Aecidium mori* on mulberry stems, and *Sclerotinia cinerea* on cherries.—*Chunjen C. Chen.*

733. Cook, Mel. T. **Philippine plant diseases.** [Rev. of: Reinking, Otto A. **Philippine economic-plant diseases.** Philippine Jour. Sci. A, 13: 165–274. *43 fig., 22 pl,* 1918. (See Bot. Absts. 2, Entry 1308.)] Bot. Gaz. 68: 310–311. 1919.

734. Cook, Melville T. **Report of the department of plant pathology.** Ann. Rept. New Jersey Agric. Exp. Sta. 1918: 299–302. 1919.

735. Cook, Mel. T. **Potato diseases in New Jersey.** New Jersey Agric. Exp. Sta. Circ. 105. *38 p.* 1919.—Along with descriptions and illustrations of the common potato diseases

the results of the spraying tests for a period of six years and the rules governing seed certification in several States are given.—*Mel. T. Cook.*

736. Cook, Mel. T. **Seed and soil treatment for vegetable diseases.** New Jersey Agric. Exp. Sta. Circ. 106. *4 p.* 1919.

737. Cook, Mel. T., and J. P. Helyar. **Diseases of grain and forage crops.** New Jersey Agric. Exp. Sta. Circ. 102. *16 p.* 1918.

738. Crain, C. C. **Warm bath for wheat.** Sci. Amer. 121: 579. *1 fig.* 1919.—Popular account is given of treatment for smut.—*Chas. H. Otis.*

739. Darnell-Smith, G. P. **Dry rot in timber.** Australian Forest. Jour. 2: 314–316. 1919.—See Bot. Absts. 5, Entry 175.

740. Edson, H. A., and M. Shapovalov. **Temperature relations of certain potato-rot and wilt-producing fungi.** Jour. Agric. Res. 18: 511–524. *9 fig.* 1920.—Single strains of *Fusarium coeruleum*, *F. discolor* var. *sulphureum*, *F. eumartii*, *F. radicicola*, *F. tricothecioides*, and a northern and a southern strain of *Verticillium albo-atrum* were grown on 2 per cent potato agar without sugar at temperatures ranging from 1° to 40°. Minimum temperature for all forms is around 5°; maximum for *F. coeruleum*, *F. tricothecioides* and *V. albo-atrum*, ("northern") 30° or slightly less, for *F. oxysporum*, about 37°, for *F. radicicola* about 39°, and for the remaining, slightly under 35°; optimum for *F. oxysporum* and *F. radicicola* about 30°; for the remaining about 25°.—A certain degree of correlation exists between the temperature relations of these organisms in pure cultures and their geographical distribution and seasonal occurrence. This is particularly striking in the case of the 2 wilt-producing fungi, *F. oxysporum* and *V. albo-atrum*.—A temperature of about 4° should hold Fusarium tuber rots in check during storage. The susceptibility of *V. albo-atrum* to high temperatures suggests the possibility of a heat treatment for seed tubers harboring the fungus.—Temperature tests in certain cases may serve as a useful supplementary method for the identification of fungi exhibiting contrasting thermal relationships.—*D. Reddick.*

741. Ellis, J. H. **The stage of maturity of cutting wheat when affected with black stem rust.** Agric. Gaz. Canada 6: 971. 1919.—See Bot. Absts. 5, Entry 20.

742. Fragoso, Romualdo Gonzalez. **Notes and communications at the session of Oct. 1, 1919.** Bol. R. Soc. Española Hist. Nat. 19: 429–430. 1919.—See Bot. Absts. 5, Entry 646.

743. Fragoso, R. G. **Enfermedades del almendro. [Diseases of the almond.]** Bol. R. Soc. Española Hist. Nat. 19: 458. Oct., 1919. [Review of an article by A. Ballester, published as a leaflet by Dir. Gen. Agric. Spain, in April, 1919.] The reviewer presents critical discussion of the publication and takes issue with several statements. *Clasterosporium carpophilum* is reported as a serious parasite, especially in its conidial stage (*Coryneum beijerinckii*). The following disease producing species omitted by Fragoso are cited: *Puccinia pruni* and *P. cerasi*, *Gloeosporium amygdalinum*, *Fusicoccum amygdali*, and *Cercospora circumscissa*.—*O. E. Jennings.*

744. Gauba, Th. **Das Hopfenmissjahr 1918. [An off-year for hops.]** Der Bierbrauer 46: 161–162. 1918.—Very grave losses (30 to 50 per cent) in Austria, Hungary and Germany occasioned by early attack of hop aphis followed by sooty mold and mildew. [Through abstr. of Matouschek in Zeitschr. Pflanzenkr. 29: 193. 1919.]—*D. Reddick.*

745. Geschwind, A. **Die der Omorikafichte (Picea omarica Panc.) schädlichen Tiere und parasitischen Pilze. [Insect enemies and diseases affecting P. o.]** Naturw. Zeitschr. Forst.- und Landw. 16: 387–395. 1918.—Diseases mentioned are caused by *Herpotrichia nigra*, *Lophodermium macrosporum* and *Trametes pini.*

746. Hecke, Ludwig. **Die Frage der Bekämpfung des Getreiderostes. [The problem of controlling cereal rusts.]** Nachrichten Deutsch. Landw. Gesell. Österreich. n. s. 2: 140-142. 1918.—In wheat regions of Austria the rusts cause damage to cereals in the following order: to wheat, yellow rust, brown rust (*P. dispersa, P. triticina*), black rust (*P. graminis*); to rye the same; to oats, black, crown rust (*P. coronifera*); to barley, dwarf rust (*P. simplex*), black rust, yellow rust. The yellow is the most destructive in rust years; brown rust attacks late. Black rust is injurious chiefly in hilly sections. In southern part, *P. maydis* is general and injurious. [Through abstr. by Matouscheck in Zeitschr. Pflanzenkr. 29: 210. 1919.]—*D. Reddick.*

747. Jehle, R. A., and others. **I. Control of cotton wilt. II. Control of cotton anthracnose and improvement of cotton.** Bull. North Carolina Dept. Agric. 41[1] (Supplem.) 5-28. *Fig. 1-6, and 1-5.* 1920.—The first part of this report contains the results of field demonstrations in several counties of the Coastal Plain section of North Carolina, in the control of cotton wilt. Dixie Wilt Resistant cotton was successfully grown on infested lands in this section. The report, furthermore, includes data on the known distribution of wilt in North Carolina and factors favoring its prevalence and spread.—The second part deals with demonstrations of the value in cotton anthracnose control, of the selection of disease free seed and improvement through breeding of these selected strains. Cleveland Big Boll and Dixie Wilt Resistant cotton were employed.—*R. A. Jehle.*

748. Krout, Webster S. **Common diseases of celery.** New Jersey Agric. Exp. Sta. Circ. 112. *12 p.* 1919.

749. McCulloch, Lucia. **Basal glumerot of wheat.** Jour. Agric. Res. 18: 543-551. *Pl. 62-63.* 1920.—This disease is widespread in U. S. A. and occurs on leaf, head and grain of wheat (*Triticum*). A dull, brownish black area appears at the base of the glumes, involving usually only the lower third but at times extends over nearly the whole surface. Sometimes the discoloration is on the inner surface of the glume. Dissection of affected spikelets shows more evidence of disease on the inner surfaces than on the outer. The grains inclosed in diseased glumes vary from nearly perfect to ones in which the germ end varies in color from a slight brown to charcoal black.—The disease is caused by *Bacterium atrofaciens* n. sp., for which a technical description is presented. The parasite is a white, polar-flagellated rod producing green fluorescence in ordinary culture media. Group number, 221.2322123.—Artificial infections were secured on leaf and head, the incubation period being about four days.—*D. Reddick.*

750. Merino, G. **Bud-rot.** Philippine Agric. Rev. 12[3]: 92-96. *4 pl.* 1919.—A brief compilation of data on the budrot of the coconut palm.—*E. D. Merrill.*

751. Moore, J. C. **Experiments with parasitic fungus on the cacao thrips.** Report on the Agricultural Department, Grenada, 1917-18. Imperial Department of Agriculture, Barbados. 1918.—Spraying experiments on thrips infesting cacao trees with cultures of the fungus *Sporotrichum globuliferum*, parasitic on *Heliothrips rubrocinctus*, Giard., are here noted. Although carried out under difficulties, the following points have been demonstrated: (1) The fungus was readily distributed amongst thrips in the field; (2) Under favourable conditions of atmospheric humidity the fungus caused death of large numbers of both young and adult thrips on the inoculated trees; (3) The fungus spread by natural agencies to trees outside the inoculated area. Several considerations of practical importance remain to be determined.—*J. S. Dash.*

752. Morgenthaler, Otto. **Über die Mikroflora des normalen und muffigen Getreides. [Microflora of normal and of musty grain.]** Landw. Jahrb. Schweiz. 32: 551-571. 1918.—Healthy grain sown in plates shows chiefly bacteria, especially *Bact. herbicola*, and no fungi. Musty grain yields many fungous thalli and few bacteria. *Penicillia* are abundant but are not responsible for the odor. What organism does impart the characteristic odor was not

determined.—Musty grain intended for human consumption should be washed thoroughly and the light grains skinned off. [Through abst. by Matouscheck in Zeitschr. Pflanzenkr. 29: 203–204. 1919.]—*D. Reddick.*

753. Müller, K. **Die Bekämpfung der Rebenperonospora nach der Inkubations-Kalendermethode. [Control of grape downy mildew by the incubation-period method.]** Jahresber. Vereinig. Angew. Bot. 16: 21–28. 1918.—Based on the investigations of Istvánffi and coworkers regarding the relation between incubation period and outbreaks of *Plasmopara*, and telluric conditions. Experimental trials made in Baden show that dates of outbreaks can be forecast with sufficient certainty to give growers warning in time to make protective treatments. [Through abst. by Seeliger in Zeitschr. Pflanzenkr. 29: 205. 1919.]—*D. Reddick.*

754. Nowell, W. **Bracket fungi of lime trees and the critical period in the development of young lime trees.** Report on the Agricultural Department, Dominica, 1917–18. 11–14. Imperial Department of Agriculture, Barbados. 1919.—The author, as Mycologist to the Imperial Department of Agriculture, reports on the prevalence of smaller fungi, of which *Nectria* and *Stilbum* spp. are the most noticeable, on the dead branches of lime trees. While functioning mostly as saprophytes, these fungi may, in certain types of cases, become weak parasites affecting principally the wood. Interesting suggestions are given on the treatment of lime trees during the critical period of their development.—*J. S. Dash.*

755. Paine, S. G., and W. F. Bewley. **"Stripe" disease of tomatoes.** Jour. Ministry Agric. Great Britain 26: 998–1000. 1920.—A brief popular account is given of "stripe" disease of tomatoes occurring chiefly in greenhouses, caused by a bacillus closely related to, if not identical with, *Bacillus lathyri*. The disease affects the tissues of the stems, leaves, and fruits which become stained a dark brown color. Suggested preventive and remedial measures consist in avoiding seed from fruit grown in an infected area, in disinfection of the soil where an attack has occurred, in using a balanced fertilizer, in using care in pruning the plants, and in altering the temperature and humidity to favor a more hardy development of the plants.—*M. B. McKay.*

756. Paine, Sydney G., and W. F. Bewley. **Studies in bacteriosis. IV.—"Stripe" disease of tomato.** Ann. Appl. Biol. 6: 183–202. *Pl. 8–9, 5 fig.* 1919.—The symptoms appear as brown to black sunken areas or stripes on the stem, as yellow to brown blotches on the leaves, as brown sunken patches on the fruit, and as brown discoloration of the root cortex. Infection appears usually to take place underground, but the disease may be spread from plant to plant above ground. A soft rapid growth of the plants renders them more susceptible to attack.—*Macrosporium solani* may occur as a saprophyte on the lesions.—Lesions occur also in the pith and cortex. The disease is assigned to a bacterial growth which advances from the root up the stem in the pith, and works outward, causing swelling and browning of the cell walls as it passes to the exterior, then spreads upward in the outer cortical layers and epidermis.—Bacteriolysis apparently may occur in the plant tissue, since some diseased spots seemed to be sterile.—The organism is described, and appears to be identical with *Bacillus lathyri*, differing only in a slightly higher resistance to heat and apparently greater ability to reduce nitrates.—An organism apparently identical with *Aplanobacter michiganense* was also isolated from affected plants, but did not reproduce the disease. [See also next following Entry, 757.]—*G. R. Bisby.*

757. Paine, Sydney G., and H. Stansfield. **Studies in Bacteriosis III.—A bacterial leaf-spot disease of Protea cynaroides, exhibiting a host reaction of possibly bacteriolytic nature.** Ann. Appl. Biol. 6: 27–29. *Pl. 2, fig. 3–6.* 1919.—The disease is characterized by dome-shaped reddish-brown blisters or by sunken spots on the leaves.—The host cells are thought to be able to kill and perhaps dissolve the bacteria. There is production of a resin-like substance in which the bacteria become imbedded. The host cells become disorganized. A red pigment allied to phloro-tannin red was produced in the spots.—The parasite was isolated from but

few of the spots. Infection experiments proved the pathogenicity of the organism isolated. —*Pseudomonas proteamaculans* n. sp. is given as the cause of the disease. [Group number is 221.1313023.) [See also next preceding Entry, 756.]—*G. R. Bisby.*

758. Petch, T. **Rubber diseases.** Tropic. Agriculturist **52**: 27–34. 1919.—The red root disease (*Poria hypobrunnea*) occurs in Ceylon and Java, in limited areas. The identification of the disease is somewhat difficult but is unmistakable in young trees, where the top root bears external mycelium which forms stout, red strands which sometimes unite into a continuous red sheet. Internally the strands are white. The mycelium turns brown and finally black with age. The diseased wood of young trees is somewhat soft and friable and permeated with red sheets which often follow the annual rings. In older trees the entire mycelium may be black.—The disease spreads largely from decaying stumps and logs of trees killed by the fungus. It is held somewhat in check by the careful removal of all felled trees and old stumps including all diseased lateral roots.—White stem blight and top canker are described briefly.—*R. G. Wiggans.*

759. Ramsbottom, J. K. **Experiments on the control of narcissus eelworm in the field.** Jour. Roy. Hortic. Soc. **44**: 68–72. *Fig. 18, 19.* 1919.—Three series of experiments for the control of *Tylenchus devastatrix* are reported. Applications of sulphate of potash alone and in combination with sulphate of ammonia, superphosphate and bone meal did not decrease the attacks. The same was true when various chemicals were applied to the soil. Following an affected crop of narcissus, rye, oats, clover, lucerne peas, broad beans, rye grass, onions, wheat, chives, buckwheat, and potatoes were planted, of which only onions became infested. —*J. K. Shaw.*

760. Reinking, O. A. **Host index of diseases of economic plants in the Philippines.** Philippine Agric. **8**: 38–54. 1919.—A host index is presented, showing diseases of about one hundred economic plants in the Philippines. The hosts are arranged alphabetically, and under each host are given the organisms (fungi and bacteria) associated with it and the names of the diseases. In addition to known parasitic forms, saprophytic organisms are included. —*S. F. Trelease.*

761. Robson, R. **Root-knot disease of tomatoes.** Jour. Roy. Hortic. Soc. **44**: 31–67. *Fig. 14–17.* 1919.—Root-knot of tomatoes (*Heterodera radicicola*) was controlled by applying 1,000 pounds cyanide of sodium (or of potassium) per acre to the subsoil. The application of 300 pounds of mercuric chloride also controlled the nematode. The cost of treatment in any of the above methods was approximately £50 per acre. No deleterious effect upon the growing crops was noted as a result of applying the above compounds at the rates per acre given. Mercuric chloride applied at the rate of 775 pounds per acre had a decided stunting effect.—*H. A. Jones.*

762. Rosenbaum, J., and Charles E. Sando. **Correlation between size of the fruit and the resistance of the tomato skin to puncture and its relation to infection with Macrosporium tomato Cooke.** Amer. Jour. Bot. **7**: 78–82. 1920.—As tomatoes grow larger, their resistance to infection by *Macrosporium tomato* greatly increases. This difference in immunity is apparently not due to chemical differences between young and old fruit. Infection may be obtained with fruits of all degrees of maturity when the skin is injured or removed previous to infection. Stomata or other natural openings in the skin are absent. As the fruit develops, the cuticle increases markedly in thickness. Authors show that coincidently with this, the skin of the fruit becomes more resistant to mechanical puncture with a needle. They suggest that ability to resist infection may be due to the ability of the skin to resist puncture by the fungous filament.—*E. W. Sinnott.*

763. Rumbold, Caroline. **The injection of chemicals into chestnut trees.** Amer. Jour. Bot. **7**: 1–20. *7 fig.* 1920.—See Bot. Absts. 5, Entry 964.

764. Rumbold, Caroline. **Effect on chestnuts of substances injected into their trunks.** Amer. Jour. Bot. **7**: 45–56. *2 pl.* 1920.—See Bot. Absts. 5, Entry 965.

765. Schander, and Fritz Krause. **Die Krankheiten und Schädlinge der Erbse.** [Diseases and insect pests of peas.] Flugbl. Abt. Pflanzenkr. Kaiser Wilhelms-Inst. Landw. Bromberg 29–30.—July, 1918.

766. Schröder, P. **Ein flacher Hexenbesen.** [A flat witches' broom.] Mitt. Deutsch. Dendrol. Gesell. **1918**: 290. *1 pl.* 1918.—On a spruce tree, 35 years old, growing at Hohen-Luckow (Mecklenburg) there is a broom 1.45 m. across and flat in form. [Through absts. by Matouscheck in Zeitschr. Pflanzenkr. **29**: 200. 1919.]—*D. Reddick.*

767. Speare, A. T. **Further studies of Sorosporella uvella, a fungous parasite of noctuid larvae.** Jour. Agric. Res. **18**: 399–439. *Pl. 51–56.* 1920.—See Bot. Absts. 5, Entry 684.

768. Spieckermann. **Schädigung der Kulturpflanzen durch zu hohen Säuregehalt des Bodens.** [Injury to cultivated plants through too high acidity of soil.] Landw. Zeitg. Westfalen u. Lippe **1918**: 255–256. 1918.—Superphosphate and sulfate of ammonia had to be used for fertilizer instead of the customary Thomas slag and nitrate of soda. Rye, oats and potatoes showed injury. The soil was found high in acidity and the lime content greatly reduced. [Through abstr. by Matouschek in Zeitschr. Pflanzenkr. **29**: 198. 1919.]—*D. Reddick.*

769. Stevens, H. E. **Citrus scab.** Florida Grower 21^1: 9. 1920.—Description and etiology of the disease with recommendations for control by spraying.—*H. R. Fulton.*

770. Üzel, H. **Rotfäule der Zuckerrübe.** [Red rot of sugar beet.] Zeitschr. Zuckerind. Böhmen **43**: 138–139. 1918.—Red rot (*Rhizoctonia violacea*) occurs mostly in wet fields. Diseased plants should be removed and destroyed. Land should be drained and quick lime worked in. It should not be planted to sugar beet, fodder beet, alfalfa, red clover, serradella, potato, asparagus, or fennochio as these plants are attacked by the fungus. Mycelium from rotten beets passes with wash water to compost and back to land. Mycelium also may winter in the wash tanks. Rotten beets can not be used for feeding as the fungus persists in manure. [Through abstr. by Matouschek in Zeitschr. Pflanzenkr. **29**: 213. 1919.]—*D. Reddick.*

771. Vincens, F. **Maladies de l'Hévéa dues au Diplodia.** [Diseases of Hevea due to Diplodia.] Bull. Agric. Inst. Sci. Saigon **1**: 321–329. 1919.—A general discussion of diseases of *Hevea* caused by *Diplodia*, with preventive treatment and remedies.—*E. D. Merrill.*

772. Winston, J. R., and W. W. Yothers. **Bordeaux-oil emulsion.** Florida Grower 23^3: 9. Jan. 18, 1920.—Directions are given for combining Bordeaux mixture and oil emulsions. Experimental results are reported of the successful use of this combination spray against certain insects and fungous diseases of citrus.—*H. R. Fulton.*

773. Wormald, H. **A phytophthora rot of pears and apples.** Ann. Appl. Biol. **6**: 89–100. *Pl. 3, 2 fig.* 1919.—*Phytophthora cactorum* was obtained from pears and apples in England. The fruit often fell prematurely. Inoculation experiments demonstrated the pathogenicity of the fungus. In one case after inoculation the hyphae were found to invade the seeds of pear. One experiment suggested that zoospores might cause infection through the uninjured skin of the pear.—The sporangia germinated either by germ tubes directly, by zoospores which escaped rapidly with the hyaline plug of the sporangium forming a vesicle around them at first, or by production of germ tubes by the zoospores within the sporangium.—The zoospores appeared to utilize the anterior cilium as the organ of locomotion.—Oospores were found. Measurements are given of the various spores and sporangia.—The fungus obtained from either apple or pear would rot both fruits.—Sanitation and spraying are suggested as control measures.—*G. R. Bisby.*

774. Zweigelt, Fritz. **Biologische Studien an Blattläusen und ihren Wirtspflanzen.** [Biological studies of aphides and their host plants.] Verhandl. Zool.-Bot. Gesell. Wien 68: 124–142. *4 fig.* 1918.—Part 1. Mechanics of sap extraction by aphides. Part 2. Anatomy and etiology of aphis galls and the rôle of the plant in formation of roll galls. Part 3. Rôle of the insect in formation of galls. [Through abstr. by Matouschek in Zeitschr. Pflanzenkr. 29: 217–219. 1919.]—*D. Reddick.*

PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

Heber W. Youngken, *Editor*

775. Albertus, Halvar. **Bidrag till kännedom om hesperidinliknande kropparsförekomst inom familjen Labiatae.** [Contribution to the knowledge of the occurrence of Hesperidin-like bodes in the family Labiatae.] Svensk. Farm. Tidskr. 23: 609. 1919.—A microscopic study was made of the stems, leaves, and in some cases the flowers of over 100 members of the family Labiatae for the presence of hesperidin-like bodies. When found, their solubility in caustic soda solution, concentrated sulphuric acid, concentrated ammonia and chloral hydrate was determined.—*A. M. Hjort.*

776. Anonymous. **Production of Pyrethrum flowers in Japan.** Sci. Amer. Supplem. 88: 305. 1919. [From Commerce Reports.]—A short article on the growing of *Chrysanthemum parthenium*, with cost and production statistics.—*Chas. H. Otis.*

777. Anonymous. **Why the castor-oil plant is called Palma Christi.** Sci. Amer. Supplem. 88: 376. 1919.

778. Babe, E., and Teodoro Cabrera. **Clitorina, nuevo reactivo indicador de acidos y alcalis.** [Clitorina, a new chemical indicator.] Revist. Agric. Com. y Trab. 2: 537–539. *1 fig.* 1919.—The name "Clitorina" is given to an indicator made by extracting with 95 per cent alcohol the coloring matter from the flowers of a double blue variety of butterfly pea, *Clitoria ternatea* L. This was found to be superior to phenolphthalein for detecting minute adulterations of milk with potash solutions. It was also found to be superior to phenolphthalein and tincture of cochineal as an indicator in some other reactions.—*F. M. Blodgett.*

779. Ballard, C. W. **The identification of gums by the phenylhydrazine reaction.** Jour. Amer. Pharm. Assoc. 9: 31–38. *Fig. 1–15.* 1920.—Author has made a study of the character of the ozazones prepared from different drugs as althaea, peach kernels, sassafras pith, brown mustard, yellow mustard, elm bark, apricot kernels, tragacanth, acacia, quince seed, linseed, indian gum, and bitter almond kernels. Method of application of test is given with sketches and description of the ozazones from the various drugs.—*Anton Hogstad, Jr.*

780. Beal, George D., and Thomas S. Hamilton. **The "Shaking-out" method for the quantitative estimation of alkaloids. II.** Jour. Amer. Pharm. Assoc. 9: 9–15. 1920.—Lead acetate when used as a clarifier for alkaloidal extracts has no harmful effect upon the extraction of the alkaloid by immiscible solvents, and that the addition of sodium chloride after clarification increases the quantity of alkaloid removed at a single extraction. Employing the use of amyl alcohol for morphine determinations a residue of anhydrous morphine could be obtained.—*Anton Hogstad, Jr.*

781. Beath, O. A. **The chemical examination of three species of larkspur.** Wyoming Agric. Exp. Sta. Bull. 120: 55–88. *Pl. 1–11, 4 fig.* 1919.—A bulletin in four parts, dealing with the poisonous properties of the three species, *Delphinium barbeyi*, *D. glaucescens*, and *D. geyeri*. Part 1 is general in its scope, dealing with the distribution, a review of the literature, losses to stock, toxicity as effected by age, acidity, seasonal variations of the poisons, characteristic symptoms. Part 2 deals with the experimental methods employed including the determination of the crude alkaloids, preparation and properties of water extracts, and the

extractive value of the solvents. Part 3 deals with the chemical analysis of the three species at different growth stages and of the principal organs of the plant at each stage. Part 4 deals with the method of treatment for Larkspur poisoning. A bibliography of the works cited is given at the end of the article.—*James P. Poole.*

782. Beythien, A. **Gewürze und Gewürz-Ersatz im Kriege.** [Spices and spice substitutes in war.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 24–33. 1919.—Current prices of spices and substitutes and composition of latter which include cauliflower-, cabbage-, celery- and mushroom-extracts, cinnamon, lemon, almond, and caraway oils, and synthetic benzaldehyde and vanilla. Many substitutes found fraudulent.—*H. G. Barbour.*

783. Buc, H. E. **Delicate test for strychnine.** Jour. Assoc. Official Agric. Chem. 3: 193. 1919.—Method of making the test is given.—*F. M. Schertz.*

784. Burque, L'abbé F.-X. **L'Identité du Poglus.** [The identity of Poglus.] Le Naturaliste Canadien 46: 145–148. Jan., 1920.—The author criticizes the determination of the species by Frère Marie-Victorin in the previous monthly issue. He closes an interesting discussion by the presentation of evidence that the Indians of the region (the Hurons of Lorette) have actually been calling no less than three species of the *Umbelliferae* by the same name, "Poglus,"—namely, *Archangelica atropurpurea*, *Ligusticum* sp.? and *Heracleum* sp.? He thinks that *Archangelica* is most likely the beneficial species for influenza. [See also Bot. Absts. 5, Entry 811.]—*A. H. MacKay.*

785. Chalmers, D. F. **Report on the operations of the Department of Agriculture. Burma. 1919:** 1–15. 1919.—See Bot. Absts. 5, Entry 11.

786. Clair, H. W. **Scottish Chamomiles.** Chem. and Druggist 91: 1512. 1919.—A comparison between the dried flowers of the "single-flowered" variety of *Anthemis nobilis*, known as Scottish chamomile, and the "double-flowered" variety of the same plant, known as English chamomile. The Scottish Chamomile, formerly cultivated to a considerable extent in the Deeside district of Scotland is more bitter and aromatic than the "double-flowered" variety and of greater value as an internal tonic medicine. The "double-flowered" variety was not obtained by ordinary cultivation from the "single-flowered" type, but by collecting seed from "sport" plants, and by a careful process of selection from these deviating forms a strain which retained the habit of producing "double flowers" was obtained. The Scottish chamomile is used but slightly outside of Scotland.—*E. N. Gathercoal.*

787. Clevenger, Joseph F., and Clare Olin Ewing. **Partial analyses of 330 American crude drugs.** Jour. Amer. Pharm. Assoc. 8: 1010–1029. 1919.—The examinations of these 330 crude drugs include scientific and trade names, part employed, color of powder, total and acid-insoluble ash; total, and volatile ether extracts (with colors and odors); and general remarks as to cleanliness of sample. [See also next following Entry, 788.]—*Anton Hogstad, Jr.*

788. Clevenger, Joseph F., and Clare Olin Ewing. **Partial analyses of 330 American crude drugs.** Jour. Amer. Pharm. Assoc. 9: 15–30. 1920.—Conclusion of article from *Ibid.* 8: 1029. 1919. [See also next preceding Entry, 787.]—*Anton Hogstad, Jr.*

789. Cushny, Arthur R. **The properties of optical isomers from the biological side.** Pharm. Jour. 103: 483. 1919.—See Bot. Absts. 5, Entry 879.

790. Dussel, G. B. **Kort overzicht over den Landbouw op Curaçao.** [A short survey of the agriculture on Curaçao.] Pharm. Weekblad 56: 1512–1514. 1919.—Most of the Curaçao Aloes comes from the Island of Aruba, but large areas are cultivated on Curaçao and Bonaire. The cultivation and propagation is very easy and inexpensive. The cuttings of old plants are set in rows about 0.5 m. apart, when in due time a short stem and rosettes of leaves will be produced, and, after the rains, a flowering stem, which divides into two or more branches,

develops. In the dry season the leaves are cut off and placed in a V-shaped container slanting on one side in order to allow the juice to drain. This is collected in empty coal-oil cans and the contents of the cans is then transferred to large copper kettles in which the juice is concentrated to the desired consistence; it is then run into paper lined petroleum boxes or into gourds. The plant, which prefers a dry, chalky soil, yields aloes for about 12 years; after this time it has to be dug up and the soil is properly manured and replanted.—*H. Engelhardt.*

791. Escobar, Romulo. **La Cicuta. [Cicuta.]** Agricultor Mexicano 36: 6–8. 1920. Description of the plant of water hemlock (*Cicuta* sp.), symptoms of the poisoning induced in sheep, and methods of eradicating the plant.—*John A. Stevenson.*

792. Ewe, George E. **Chinese cantharides. [Mylabris Cichorii.] A worthy candidate for admission to the U. S. P.** Jour. Amer. Pharm. Assoc. 9: 257–263. 1920.—Upon experimentation, employing a series of physiological tests on horses, it was found that *Mylabris Cichorii* has a vesicating and rubefacient power equal to the U. S. P. varieties. The cantharidin content on the average was found to be 50 per cent greater than the U. S. P. varieties. Author also states that the material is cheaper and more available at the present time.—*Anton Hogstad, Jr.*

793. Ewe, George E. **The assay of calabar beans and its preparations.** Jour. Amer. Pharm. Assoc. 8: 1006–1009. 1919.—Author was unable to obtain satisfactory results with the present U. S. P. method for the assay of calabar beans and its preparations. He believes the loss to be due partly to incomplete extraction and partly to decomposition of alkaloids by numerous manipulations and vigorous heating treatments and by long exposure to light required in carrying out the process. Methods of the writer are given for the assay of the drug and its preparations.—*Anton Hogstad, Jr.*

794. Ewing, C. O. **White pine bark adulterated with elm bark.** Jour. Amer. Pharm. Assoc. 9: 253. 1920.—Upon examination a shipment of white pine bark collected in Michigan was found to contain elm bark. The outer part of the bale, to the depth of about 1 foot, consisted almost entirely of the rossed outer bark of *Ulmus fulva.*—*Anton Hogstad, Jr.*

795. Ewing, Clare Olin, and Arno Viehoever. **Acid-insoluble ash standards for crude drugs.** Jour. Amer. Pharm. Assoc. 8: 725–730. 1919.—Upon reviewing the analyses of a considerable number of domestic and imported crude drugs with regard to their content of ash and acid-insoluble ash, authors noted in a number of instances where a striking discrepancy occurred between the general run of analyses and the U. S. P. and N. F. standards. The authors suggest, as an expression of their personal opinion that an extension of ash standards including limits for acid-insoluble ash would be very much preferable to present standards and that it should not only be included in the U. S. P. but should be extended. The authors then discuss the question of ash contents of several drugs, namely asafoetida, hydrastis, hyoscyamus, mustard, rhubarb and sassafras, emphasizing the need of acid-insoluble ash standards. Simple method of writers included for determining acid-insoluble ash content.—*Anton Hogstad, Jr.*

796. Farwell, Oliver A. **Cramp bark, highbush cranberry.** The Druggist 2: 13. 1920.—It has been known since 1913 that the commercial Cramp Bark is the product of *Acer spicatum* Lam. and not the true *Viburnum Opulus* var. *americanum*, Mill, as required in the National Formulary and as stated in the text books. Farwell now produces evidence to show that as long ago as 1870 the Acer bark had displaced the true Viburnum bark.—*Wm. B. Day.*

797. Fishlock, W. C. **Bay leaves (Pimenta acris).** Report on the Agricultural Department, Tortola, 1917–18, 6. Imperial Department of Agriculture, Barbados. 1919.—A reference is made here to the existence of "false" or bad varieties of the bay tree whose leaves yield an oil of inferior quality for making bay rum.—*J. S. Dash.*

798. French, Harry B. **Review of the drug market.** Jour. Amer. Pharm. Assoc. 8: 843-844. 1919.—A general discussion of the effect of the signing of the Armistice on the drug market. Writer states that the general tendency of American crude drugs has been to greatly advance in price since the signing of the Armistice and that this tendency will continue for the next several months. Chemicals have a tendency to decline and European crude drugs will be obtainable at lower prices as soon as they can finance shipments and transportation can be arranged.—*Anton Hogstad, Jr.*

799. Fuller, H. C. **Report on alkaloids.** Jour. Assoc. Official Agric. Chem. 3: 188-193. 1919.—It is recommended that in conducting assays for strychnine, reliance be placed on a gravimetric determination and not on a determination obtained by volumetric means.—*F. M. Schertz.*

800. Gathercoal, E. N. **The permanency and deterioration of some vegetable drugs twenty-five years of age.** Jour. Amer. Pharm. Assoc. 8: 711-716. 1919.—Examination of some 144 crude drugs which were prepared some twenty-five years ago and which had been kept in glass-stoppered bottles, showed that most of the drugs were very well preserved and which compared with the present U. S. P. and N. F. requirements. Among the drugs much depreciated were Orange and Lemon peels, Labiatae herbs and a number of leaf drugs (Buchu, Boneset, Coltsfoot, Witchhazel, Matico, Gaultheria, and probably Pilocarpus).—*Anton Hogstad, Jr.*

801. Greig-Smith, R. **The germicidal activity of the Eucalyptus oils. Part I.** Proc. Linnean Soc. New South Wales **44**: 72-92. *Fig. 1.* 1919.—Eucalyptus oil as listed in Materia Medica is from *E. globulus*. Many oils of other origin are sold under this name. The Baker and Smith classification of oils is followed in these tests to determine the toxic effect of 40 to 50 specimens of crude and refined oils. *E. polybractea* (Blue Mallee), *E. cinerea* (Argyle apple), *E. australiana* (Narrow-leaf peppermint), and *E. dives* (Broad-leaf peppermint) are at present the chief sources of commercial oils in New South Wales. The test-organisms employed to determine the toxicity of the oils were *Micrococcus aureus* and *Bac. coli communis* from serum suspensions. The activity and quality of the oil was found to vary strikingly even within the same tree and also with different specimens of a species. It was affected by altitude and growth conditions in general. On the whole these oils had lower toxicity than phenol. The results of the tests are given in nine tables. The main constituents seemed relatively insignificant with reference to toxic action. Bactericidal power was proportional to the acidity of the oil and assisted by although not caused by it alone. The iodide reaction was no criterion as to the germicidal value of the oils. The vapors of the oils had decided bacterial action.—*Eloise Gerry.*

802. Griebel, C., and A. Schäfer. **Thymus Serpyllum L. als Majoranpulververfälschung. [Wild thyme as imitation marjoram powder.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **38**: 141-145. 1919.—The chief morphological characteristics of marjoram and of wild and common thyme are compared.—*H. G. Barbour.*

803. Grimme, C. **Altes and Neues ueber Capsella Bursa pastoris. Mittheilung aus dem Institut fuer angeswandte Botanik. [Old and new facts about capsella bursa pastoris. Communication from the institute for applied botany.]** Pharm. Zentralhalle Deutschland **60**: 237-242, 248-251. 1919.—Shepherd's purse has been used since times immemorial as a home remedy, as diuretic and antipyretic. Recent investigations have shown that the drug possesses strongly hemostyptic properties and can be used as a substitute for the high-priced and in Germany unobtainable golden seal. The chemistry of the drug is still to be investigated but the medicinal value seems to be partly due to mustard oil which is present in all parts of the plant, but especially in the seeds.—*H. Engelhardt.*

804. Guérin, P. [Rev. of: Étienne, P. **Étude anatomique de la famille des Épacridees. (Anatomic study of the family Epacrideae.)** Thése Doct. Univ. Pharm. Toulouse. *222 p. 116 fig.* 1919.] Bull. Sci. Pharm. **26**: 533. 1919.—The author describes the anatomic structure of

the branches and leaves of 26 members of the family *Epacrideae*. The *Epacrideae* appear to take in Oceania the place which the *Ericaceae*, to which they are nearly related, take in South Africa.—*H. Engelhardt.*

805. Guérin, P. [Rev. of: Berger, Marie-Gaston. **Étude organographique, anatomique et pharmacologique de la famille des Turnéracées. (Organographic, anatomic and pharmacologic study of the family Turneraceae.)** *270 p., 53 pl.* Bigot Frères: Paris, 1919.] Bull. Sci. Pharm. 26: 533. 1919.—The six genera of the family Turneraceae can easily be distinguished from each other by their anatomic structure. The author believes that the Turneraceae must be considered as a special family, but if taken away from the Bixaceae, they should be counted to the family Passiflorae. The author further deals with the medicinal use of the members of this family, and especially of that of damiana (Turnera aphrodisiaca) and with the various substitutes offered for this drug.—*H. Engelhardt.*

806. Hart, Fanchon. **A microscopical method for the quantitative determination of vegetable adulterants.** Jour. Amer. Pharm. Assoc. 8: 1032–1034. 1919.—The areas of the various tissues present are totalled by the aid of an ocular micrometer used in conjunction with a stage micrometer and from these figures the author calculates the percentage of impurities. The author gives method of examination for black pepper adulterated with pepper shells and checks results obtained by measuring the shells and powdered kernel portions in a 10 minim graduate.—*Anton Hogstad, Jr.*

807. Hatcher, Robert A. **Standardization of digitalis. A preliminary report.** Jour. Amer. Pharm. Assoc. 8: 913-914. 1919.—The author reports the results obtained by separating the principles of Digitalis into two groups, namely, the chloroform-soluble fraction and the water-soluble fraction. The chloroform-soluble fraction was found to be more readily absorbed and more lasting in its effects while the water-soluble fraction being more actively emetic. Author believes that Digitalis should be assayed in reference to the chloroform-soluble fraction and that this fraction may be made available for intravenous use, since it mixes perfectly with water.—*Anton Hogstad, Jr.*

808. Jones, J. **Bay oil.** Report on the Agricultural Department, Dominica, 1918–19: 5. Imperial Department of Agriculture, Barbados. 1919.—Two samples of oil from varieties of *Pimenta acris*, namely Bois d'Inde and Bois d'Inde Citronelle, grown in Dominica, are reported on. The latter variety contains a smaller percentage of Phenols, and has a strong odour of citral, and the suggestion is made that it may have some commercial value in the manufacture of toilet preparations.—*J. S. Dash.*

809. Jones, J. **Camphor.** Report on the Agricultural Department, Dominica, 1918–19: 5-7. Imperial Department of Agriculture, Barbados. 1919.—Results of distillations of leaves, twigs and prunings from three plots showed that two of them were of true camphor trees, yielding both camphor and oil, while the other was not, the material from it producing oil only.—*J. S. Dash.*

810. Keenan, G. L. **The microscopical identification of mowrah meal (Bassia) in insecticides.** Jour. Amer. Pharm. Assoc. 9: 144–147. *Fig. 1-3.* 1920.—In the examination of products designated as ant and worm eradicators, author detected the presence of mowrah meal, which he states resembles cocoa powder in general appearance. The powder consists largely of the powdered cotyledons and occasional fragments of seed coat. Chloral hydrate reveals the presence of yellowish-brown masses occurring separately as isolated fragments and also in characteristic group arrangement. The uses of mowrah meal and a morphological description of *Bassia latifolia* are also included. With bibliography.—*Anton Hogstad, Jr.*

811. Marie-Victorin, Fr. des E. C. **L'identité du Poglus (Heracleum lantatum, Michx). [The identity of Poglus of the Hurons of Lorette.]** Le Naturaliste Canadien 46: 121–124. Dec., 1919.—The Indians (Hurons) of Lorette, Province of Quebec, have been using the root of

Poglus with wonderful success against epidemic influenza. M. L'Abbe F.-X. Burque. (*Ibid.* 45: 67–70. 1918) had identified it with *Angelica atropurpurea* L. (*Archangelica atropurpurea* (L.) Hoffm.).—The author accompanied by M. Edouard Laurin visited Bastien, the local Indian chief, who pointed out a young specimen of *Poglus* which had not yet its radical leaves. The abundant pubescence showed it could not be *Angelica*. Further examination convinced him it was *Heracleum lanatum* Michx. (la Berce laineuse). Chief Bastien insisted on the powerful febrifuge properties of the plant, and cited extraordinary cases of cures. It was believed to be the cause of the protection of the tribe from the epidemic. The Hurons collect the root in autumn, and use the infusion.—The author then quotes authorities on the properties of *Heracleum*, notes its distribution, and describes its appearance and habitat. [See also Bot. Absts. 5, Entry 784.]—*A. H. MacKay.*

812. Merrill, E. C. **Preliminary study of some of the physical and chemical constants of balsam Peru.** Jour. Assoc. Official Agric. Chem. 3: 194–197. 1919.—The method for the determination of the iodine value of cinnamein by Hanus, as at present employed, is unsatisfactory and furthermore may be entirely inadequate as an index of the character of pure Peru balsam. The employment of such physical constants as viscosity, surface tension, optical rotation and refractometer observation may prove of value in the final interpretation of the character of Peru balsam.—*F. M. Schertz.*

813. Nelson, E. K. **The constitution of capsaicin, the pungent priciple of capsicum. II.** Jour. Amer. Chem. Soc. 42: 597–599. 1920.

814. O'Brien, J. F., and J. P. Snyder. **Deterioration of high-test American grown Digitalis.** Jour. Amer. Pharm. Assoc. 8: 914–919. 1919.—Assays of the tincture and fluid-extract of Digitalis made from American-grown Digitalis from the state of Washington, after being kept for a period of two and one half years, under conditions which closely paralleled those of the average drug store, showed that these preparations did deteriorate and that the deterioration was practically the same in both preparations. By the guinea pig method the loss in activity was from 330 to 175 per cent, a loss of 47 per cent; the one hour frog method the loss in activity was from 264 to 120 per cent, a loss of 55 per cent; by the cat method the loss in activity was from 250 to 175 per cent, a loss of 30 per cent. However, all the preparations after standing this length of time still retained sufficient activity for them both to be considered standard preparations.—*Anton Hogstad, Jr.*

815. Passerini, N. **Sul potere insetticida del Pyrethrum cinerariaefolium Trev. coltivato a Firenze in confronto con quello di alcune altre Asteracee. [A comparison of the insecticidal value of Pyrethrum cinerariaefolium Trev. grown at Florence with other members of the Asteraceae.]** Nuovo Gior. Bot. Italiano 26: 30–45. 1919.—Both as regards rapidity of action and effectiveness *Pyrethrum cinerariaefolium* Trev. is superior as an insecticide to other members of the *Asteraceae*. If ground into a fine powder, the heads, foliage, stems and roots of the plant are equally effective; however, the most rapid action is obtained from the heads of the plant.—*Ernst Artschwager.*

816. Petrie, J. M. **The occurrence of methyl laevo-inositol in an Australian poisonous plant.** Proc. Linnean Soc. New South Wales 43: 850–867. *2 fig.* 1918.—*Heterodendron oleaefolium* Desf. (Sapindaceae) a large, drought-resistant shrub, endemic to Australia, which has been described as a valuable forage plant was suspected of causing fatalities to cattle and horses. It was found to be strongly cyanogenetic. It contains the methyl ester of laevo-rotary inositol and the method of extraction and characteristics and properties of the compound are given in detail. The amount isolated was equivalent to 0.65 per cent of the dried (at 100°C.) leaves. It is not optically isomeric with pinite of Maquenne, which is the methyl dextro-inositol, possessing a different melting point and optical rotation. It is apparently identical with Tanret's quebrachite and has been previously recorded for three plants only—*Aspidosperma querbracho* (Apocyanceae), *Hevea brasiliensis* (Euphorbiaceae)

and *Grevillea robusta* (Proteaceae). The occurrence of this compound is exceedingly rare, in contrast to the inactive inositol which exists as a plastic substance in most plants. *Heterodendron* also contains a cyanogenetic glucoside.—*Eloise Gerry.*

817. Pittenger, Paul S. **Preliminary note on a new pharmaco-dynamic assay method.** Jour. Amer. Pharm. Assoc. 8: 893-900. 1919.—Writer states that the goldfish method is unquestionably the simplest so far proposed and can be easily carried out by those not specially skilled in the pharmacodynamic art. A tincture of Digitalis should have a minimum lethal dose of 2.85 when assayed by this method. Results of the authors experiments are recorded as well as details of methods employed including a list of apparatus necessary for the experiments.—*Anton Hogstad, Jr.*

818. Pittenger, Paul S., and George E. Ewe. **The standardization of Piscidia Erythrina (Jamaica dogwood).** Amer. Pharm. Jour. 91: 575-583. *Fig. 1-3.* 1919.—The similarity between the action of Jamaica dogwood and that of Cannabis, suggested the possibility of employing similar methods of standardization. The following tentative standard was adopted: Fluidextract of Jamaica dogwood should be of such strength that it will produce incoordination in dogs in doses of 0.55 mils per kilo weight of animal and should not produce incoordination in doses less than 0.5 mils per kilo, the drug being administered by capsule after fasting the animal for 12 hours. A series of experiments were conducted to assay Jamaica dogwood preparations according to the piscidin content, but on account of the contamination with resinous matter it was difficult to obtain the piscidin in a pure state, therefore as the authors state we are without a reliable chemical means of accurate standardizing Jamaica dogwood preparations, but that they can be accurately standardized by the physiological assay method.—*Anton Hogstad, Jr.*

819. Reens, Emma. **The Coca de Java.** [Javanese coca.] Bull. Sci. Pharm. 26: 497-505. 1919.—A detailed study of the cultivation and propagation of the coca tree is given together with data on collecting the leaves, the extraction and purification of the alkaloid. The author states that while in South America the leaves of *E. bolivianum* and *E. peruvianum* are altogether used, in the East Indies and especially in Java *E. spruceanum* or *E. novogranatense* is cultivated.—*H. Engelhardt.*

820. Robson, W. **Bay trees (Pimenta acris).** Report on the Agricultural Department, Montserrat, 1917-18: 17. Imperial Department of Agriculture, Barbados. 1919.—A record is given of the yield of Bay leaves and oil from a plot for seven consecutive years. The results of 41 distillations during 1917 are given. From these it was found that the average Phenol content was 55 per cent, being 5 per cent higher than the average for 1914-16.—*J. S. Dash.*

821. Robson, W. **Ajowan Plant (Carum copticum).** Report on the Agricultural Department, Montserrat, 1917:18: 19-22. Imperial Department of Agriculture, Barbados. 1919.—Interesting cultural and distillation trials are recorded with this plant. The percentage of oil in the seed was found to be 3, while the per cent Thymol in the oil is given as 40 to 45.—*J. S. Dash.*

822. Robson, W. **American horsemint (Monarda punctata).** Report on the Agricultural Department, Montserrat, 1917-18: 22-23. Imperial Department of Agriculture, Barbados. 1919.—Small trials with this plant gave satisfactory results, the oil obtained from distillation containing about 44 per cent by weight of Thymol.—*J. S. Dash.*

823. Rowe, L. W. **Maintaining frogs for test purposes.** Jour. Amer. Pharm. Assoc. 8: 928-930. *1 fig.* 1919.—A description with sketch of a tank for maintaining frogs for test purposes.—*Anton Hogstad, Jr.*

824. Rowe, L. W. **Digitalis standardization. A consideration of certain methods of biological assay.** Jour. Amer. Pharm. Assoc. 8: 900-912. 1919.—Experiments were performed, first to determine whether any relationship exists between the results of assays by the cat

and frog methods; second, to determine the accuracy of the cat method and third to suggest certain modifications of the method, in order to make it more practical for commercial assay work. Sufficient data was not obtained with cats to absolutely prove that they are as unsatisfactory as dogs but from data reported indicates that there is no real consistency between the results obtained when using the cat and those obtained with the frog. Author states that it seems most logical to conclude that no relationship exists between the minimum lethal doses of heart tonic preparations to cats, dogs, and frogs, but that the frog method is the most accurate of the three. With bibliography.—*Anton Hogstad, Jr.*

825. Sayre, L. E., and G. N. Watson. **Final report on the alkaloids of Gelsemium.** Jour. Amer. Pharm. Assoc. 8: 708–711. 1919.—Investigations by the authors seem to show that there does not exist in the drug any such alkaloid as Gelseminine, but that this constituent (so-called) is a compound body consisting of several alkaloids having different properties. Methods are given for the separation of these various substances including Sempervirene, Gelsemic acid, Gelsemine and another substance named by the authors "Gelsemidine"—not "Gelseminine"—since gelseminine, the name formerly given to the amorphous alkaloids of gelsemium, has been proved conclusively to be not a single alkaloid but a mixture of three alkaloids. Another substance was also obtained which was strongly alkaloidal in appearance and behavior and very much like Lloyd's Emetoidine, which the authors state might be called "Gelsemoidine." Physical descriptions of these substances follow.—*Anton Hogstad, Jr.*

826. Sprinkmeyer, H., and O. Gruenert. **Über Vanillinerzeugnisse.** [Vanilla products.] Zeitschr. Untersuch. Nahrungs- u. Genussmittel 38: 153–155. 1919.—Deterioration of vanilla and related substances in mixtures.—*H. G. Barbour.*

827. Stanford, Ernest E., and Clare Olin Ewing. **The resin of man-root (Ipomoea pandurata (L.) Meyer) with notes on two other Convolvulaceous resins.** Jour. Amer. Pharm. Assoc. 8: 789–795. *Fig. 1.* 1919.—Alcoholic extracts of three Convolvulaceous roots gave the following results: *Ipomoea pandurata* (Man-root) 4.65 per cent of resin; *I. batata* (Sweet potato) 0.56 per cent of resin; *I. discoidesperma* Dönn. Sm. (Yellow morning glory) 6.5 per cent of resin. The resin of man-root possessed mild cathartic properties, that of the sweet potato failed to demonstrate any cathartic action. The material on hand of the yellow morning glory was insufficient for adequate tests. Examination of the extracts of man-root and sweet potato with various organic solvents showed them like other Convolvulaceous resins to be of complex composition and partly of glucosidal nature. No chemical examination was made of the resin of yellow morning glory. Descriptions of the roots are included. With bibliography.—*Anton Hogstad, Jr.*

828. Steel, I. **Plantago in medicine.** Australian Nat. 4: 105–107. 1919.—Its uses as a native home remedy. Some references to its properties in English literature.—*T. C. Frye.*

829. Stockberger, W. W. **Commercial drug growing in the United States in 1918.** Jour. Amer. Pharm. Assoc. 8: 807–811. 1919.—A report on the progress of the cultivation of a number of drugs as Belladonna, Cannabis, Digitalis, Calendula, Sage and Henbane. Summarizing the total production the author states that in the case of Belladonna approximately 83 tons of herb (including leaves and stems), and 11 tons of root; 60 tons of Cannabis; 9000 to 10,000 pounds of Sage have been produced in the United States during 1918. No figures were given for the production of Calendula. Very little success has been attained in the commercial cultivation of Henbane. Digitalis has not been placed on an established commercial basis as yet.—*Anton Hogstad, Jr.*

830. Stroup, Freeman P. **A chemical test to distinguish between caffeine and theobromine.** Amer. Jour. Pharm. 91: 598–599. 1919.—Employing the use of potassium bichromate and sulphuric acid, the author states that it is a simple matter to distinguish between caffein and theobromin, according to the colors produced.—*Anton Hogstad, Jr.*

831. Styger, Jos. **Beiträge zur Anatomie des Umbelliferenfruchte. [Contribution on the anatomy of umbelliferous fruits.]** Schweiz. Apotheker Zeitg. 57: 199–205, 228–235. *7 fig.* 1919.—A description of the macroscopic and microscopic characteristics of the fruits of *Angelica Archangelica*, *F. Narthex*, *F. galbaniflua*, *F. angulata*, *Pastinaca sativa*, *Heracleum Spondylium*, *Laserpitium Siler*, *L. marginatum*, *Opopanax chironeum*, and *Daucus Carota*. *Angelica Archangelica* is winged and its mesocarp is composed for the most part of loosely arranged, porous and reticulately thickened parenchyma with large intercellular-air-spaces; its vittae are distributed above the inner epidermis and in the ribs. *Ferula Narthex* shows a band of thick-walled, punctated cells in the inner mesocarp and giant vittae in the mesocarp. *F. galbaniflua* is distinguished from *F. Narthex* by having vittae in the ribs as well as the mesocarp. *F. angulata* possesses vittae in mesocarp and ribs, its outer epidermis and the cell layers lying directly beneath are strongly thickened but not woody, and hesperidin crystals exist in all the epidermal cell glands. *Pastinaca sativa* shows vittae alongside vascular bundles, a sclerenchyma band in the inner mesocarp and finely punctated parenchyma in its winged ribs. *Heracleum Spondylium* has a sclerenchyma band in the inner mesocarp and finely punctated thick-walled parenchyma in the wings outside of the bundles. *Laserpitium marginatum* has elliptical vittae while those of *L. Siler* are triangular, as viewed in cross section. *Opopanax chironeum* shows cells of epidermis, wings and within vascular bundles with elliptical punctations; *Daucus Carota* has delicate spines growing from secondary ribs, and bristle-hairs only on primary ribs. [See also next following Entry, 832.]—*H. W. Youngken.*

832. Styger, Jos. **Beiträge zur Anatomie des Umbelliferenfruchte. [Contribution on the anatomy of Umbelliferous fruits.]** Schweiz. Apotheker Zeitg. 57: 243–250. 1919.—An analytical key, based upon a pharmacognic system, to the 50 Umbelliferous fruits described by the author in preceding pages of this serial. These are placed in 3 main groups, viz.: I. Without oil containing elements. II. With secretion sacs. III. With oil reservoirs (vittae). The first two of these captions have but one representative each, viz.: *Conium maculatum* and *Hydrocotyle vulgaris* respectively. The third group includes two subdivisions: 1. With commissurral vittae only. 2. With dorsal and commissural vittae. Further grouping of these subdivisions is based upon presence of one or more vittae in mesocarp, sclerenchyma plates, hairs, strongly thickened and lignified parenchyma elements in mesocarp, secondary vittae, and distribution of the vittae in inter-rib and rib regions. [See also next preceding Entry, 831.]—*H. W. Youngken.*

833. Sutton, Richard L. **Ragweed dermatitis.** Jour. Amer. Med. Assoc. 73: 1433–1435. 1919.—The important part played by anaphylaxis in the causation of various eruptions has long been recognized. Anaphylaxis has been defined as "a state of hypersusceptibility of the organism to foreign substances, which is brought about by the introduction of certain foreign substances and their cleavage products." C. Walker has pointed out that certain proteins, including those of ragweed pollen may cause dermatitis in predisposed persons. The author describes four cases of ragweed dermatitis. In two of them the common ragweed, *Ambrosia elatior*, was the chief offender. The giant ragweed, *A. trifolia*, the mugwort, *A. psilostachya*, and the bur marsh-elder, *Iva xanthifolia*, probably occupy lesser rôles. All have been shown to cause hay fever. Pollen vaccine treatment gave beneficial results.—*Wm. B. Day.*

834. Thurston, Azor. **Oil of sandalwood and its adulteration.** Jour. Amer. Pharm. Assoc. 9: 36–37. 1920.—A compilation of the refractive indices and optical rotations of some 42 samples of commercial sandalwood oils with a few additional notes. With bibliography. —*Anton Hogstad, Jr.*

835. Viehoever, Arno. **The pharmacognosy laboratory, its activities and aims.** Jour. Amer. Pharm. Assoc. 8: 717–725. 1919.—A detailed account of the activities and aims of the Pharmacognosy Laboratory, Bureau of Chemistry, U. S. Department of Agriculture, prepared in the hope that other workers engaged in pharmaceutical and related research, may be induced

to prepare similar statements, sufficiently detailed to indicate the nature of their studies though the work may still be in progress.—Part I is devoted to a discussion of Crude Drug Control in which the author discusses various phases of the work, as domestic trade; import trade; elimination of inert and objectionable material in crude drugs and spices; extension of standardization of purity for drugs; value of volume weight determinations; pharmacopoeial work; prevention of waste and utilization of waste crude drug products.—Part II is devoted to the investigations of the pharmacognosy laboratory which cover a wide range of pharmaceutical and chemical research. Author also discusses the coöperative work of the laboratory with various institutions, laboratories, etc. With bibliography.—*Anton Hogstad, Jr.*

836. Vierhout, P. **Het Winnen van Curacao-Aloe.** [The production of Curaçao aloes.] Pharm. Weekblad. 56: 1510–1512. *Pl. 1, fig. 3.* 1919.—A description of methods of collecting aloes in Curaçao.—*Abstractor.*

837. Wirth, E. H. **A study of Chenopodium ambrosioides var. anthelminticum and its volatile oil.** Jour. Amer. Pharm. Assoc. 9: 127–141. *22 fig.* 1920.—The author has made a study of the oil of Chenopodium which falls under the heading of the "western oils" in order to compare same with the Maryland variety, the latter according to general opinion has been claimed to be superior to the former.—A detailed discussion as to the composition of the oil is given, the western oil agreeing with the Maryland oils, save in the amount of ascaridol which is present in the latter from 60 to 80 per cent and in the former the average was 42 to 45 per cent. Specific gravity of western oil 0.934 compared to a specific gravity of 0.955–0.980 as stated in the U. S. P. Upon subjecting an oil with a specific gravity of 0.934 to steam distillation, one fraction, 70 to 75 per cent had a specific gravity of 0.900 and 25 to 30 per cent had a specific gravity of 1.000, thereby showing that the western oil might be fractionated on a commercial basis. Experiments found this to be impracticable owing to the waste involved. —An exhaustive pharmacognostic study of *Chenopodium ambrosioides anthelminticum* is given, in which the author, by microchemical tests, employing 5 per cent KOH in 95 per cent alcohol, shows that the oil is not contained in the seeds but occurs only in the glandular hairs and here only in the large thin-walled terminal hairs. The hairs upon the leaves were found to contain oil but no glandular hairs were noted on the stems, which thus eliminates using stem portions for the production of the oil. Flowers also contain oil, which sets forth the value of subjecting the plant to distillation at the time of flowering.—*Anton Hogstad, Jr.*

838. Wong, Ying C. **Opium in China.** Amer. Jour. Pharm. 91: 776–784. 1919.—An interesting account of this gigantic evil which has cost China billions of dollars and, more important than that, has led millions and millions of her strong citizens into wreck and misery. Author discusses in detail the history and cultivation of the poppy; interesting synonyms and their application to the different grades of opium; opium smoking; suppression of the poison.—*Anton Hogstad, Jr.*

839. Wunschendorff, M. E. **La racine d'Atractylis gummifera.** [The root of Atractylis gummifera.] Jour. Pharm. et Chim. 20: 318–321. 1919.—The writer gives an account of the earlier investigations of the root by Lefranc. He succeeded in isolating about 4 per cent of a petroleum-ether soluble resin, which was insoluble in water and alcohol, but gave pseudo-solutions with chloroform, benzene, carbon tetrachloride, carbon disulphide, etc. It had all the characteristics of caoutchouc and could easily be vulcanized. He further isolated tannic acid, several sugars and a substance which probably was identical with Lefranc's potassium atractylate. The ash, 14.8 per cent, was rich in silica and iron.—*H. Engelhardt.*

840. Yamamoto, R. **On the insecticidal principle of Chrysanthemum cinerariifolium.** Ber. Ohara Inst. Landw. Forsch. 1: 389–398. 1918.—Pyrethron, the insecticidal principle, is a yellow, transparent, neutral syrup, having a saponification value of 216 and iodine value of 116. It is easily saponified with alcoholic potash and loses its insecticidal power after saponification. The power of this pyrethron is reduced either by heating or exposure to the air for a long time. Pyrethron has germicidal as well as insecticidal powers.—*H. S. Reed.*

841. Youngken, Heber W. **Observations on Digitalis Sibirica.** Jour. Amer. Pharm. Assoc. 8: 923-928. *14 fig.* 1919.—A botanical investigation of *Digitalis Sibirica* Lindley, including a description of the plant, histology of leaf, stem and root. Author found that a tincture prepared from the dried leaves according to the U. S. P. method for tincture of digitalis and when assayed by the one-hour frog method, showed the tincture to be three quarters over the strength required for the U. S. P. tincture of digitalis.—*Anton Hogstad, Jr.*

PHYSIOLOGY

B. M. Duggar, *Editor*

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GENERAL

842. Bechhold, H. **Colloids in biology and medicine.** [Translated from the second German edition, with notes and emendations by Jesse G. M. Bullowa.] *XV + 464 p., 54 fig.* Van Nostrand Co.: New York, 1919.—Proof sheets of the original were received in 1915 and 1916, but the translation has been brought practically up to date by numerous insertions and notes. The work is divided into four parts as follows: I. Introduction to the study of colloids, 127 p. II. Biocolloids, 83 p. III. The organism as a colloid system, 144 p. IV. Toxicology and pharmacology, microscopical technic, 77 p.—The strictly biological (physiological) aspects deal in a larger measure with animal structures and behavior, due largely to the greater specialization in such organisms, but the plant material is in nowise neglected.—*B. M. Duggar.*

843. Haldane, J. S. **The new physiology and other addresses.** *VII + 156 p.* Charles Griffin & Co., Ltd.: London, 1919.—This small volume embodies six addresses under the following titles: (1) the relation of physiology to physics and chemistry; (2) the place of biology in human knowledge and endeavour; (3) the new physiology; (4) the relation of physiology to medicine; (5) the theory of development by natural selection; and (6) are physical, biological, and psychological categories irreducible? Each topic includes some discussion more or less directly relating to the field, problems, or development of physiology and physiological concepts. Special emphasis is placed upon arguments designed to strengthen the claims of biology as an independent science, and with these the distinctive field of physiology as a fundamental branch of this science. Despite the accumulation of facts relating to the "physical and chemical sources and the ultimate destiny of the material and energy passing through the body" there is "an equally rapidly accumulating knowledge of an apparent teleological ordering of this material and energy." The old "vital force" could never become a working hypothesis; on the other hand, physico-chemical explanations of the mechanism of such processes as respiration are difficult and disappointing, while such assumptions applied to heredity "make the physico-chemical theory of life unthinkable." Nevertheless "we need not sit down in despair, for we can look for other working conceptions."—*B. M. Duggar.*

844. McLean, F. T. **Opportunities for research in plant physiology in the Philippines.** Philippine Agric. 8: 27-31. 1919.—A short article pointing out some of the advantages of the Philippine Islands as a place for research in plant physiology.—*S. F. Trelease.*

845. Willows, R. S., and E. Hatschek. **Surface tension and surface energy and their influence on chemical phenomena.** *2nd ed. VIII + 115 p., 21 fig.* Text-books of chemical research and engineering. Blakiston's Son & Co.: Philadelphia, 1919.—The new edition does not depart from the first in presenting for both biologist and chemist a concise discussion of the fundamental laws of surface tension and surface energy without necessarily applying these to specific phenomena. An additional chapter deals with complex phenomena including such topics as stable emulsions, the theory of dyeing, also tanning.—*B. M. Duggar.*

PROTOPLASM, MOTILITY

846. Chambers, Robert. **Changes in protoplasmic consistency and their relation to cell division.** Jour. Gen. Physiol. 2: 49–68. 1919.—See Bot. Absts. 5, Entry 119.

DIFFUSION, PERMEABILITY

847. De Vries, O. **Verband tusschen het soortelijk gewicht van latex en serum en het rubbergehalt van de latex. [The relation between the specific gravity of latex and serum and the rubber content of latex.]** Arch. Rubbercult. Nederlandsch-Indië 3: 183–206. 1919.—See Bot. Absts. 5, Entry 183.

848. Dixon, H. H., and W. R. G. Atkins. **Osmotic pressures in plants. VI. On the composition of the sap in the conducting tracts of trees at different levels and at different seasons of the year.** Sci. Proc. Roy. Dublin Soc. 15: 51–62. 1918.—The aim of this paper is the study of sap composition at different levels in the same tree and the examination of similar trees during the various seasons of the year. Three trees of *Acer macrophyllum*, two each of *Ilex aquifolium* and *Cotoneaster frigida*, and one each of *Arbutus unedo* and *Ulmus campestris* were employed.—The sap was centrifuged from the fresh conducting wood of the trees. It was found to vary greatly in color and in content of both sugars and salts. During the late autumn and winter while the trees are dormant the osmotic pressure is small and approximately constant throughout the wood sap. The upper portions of the stem and the roots have slightly greater pressure than the central portions. In the early spring large quantities of sugars from the storage cells of the wood parenchyma and the medullary rays are added to the sap. This is followed by a marked increase in osmotic pressure from root to crown, the greater increase occurring in the upper part of the tree. During late spring the concentration of salts is very much greater than in early spring. At this time the concentration of sugars is still high, being about half the maximum concentration.—In *Acer macrophyllum*, sucrose is present in quantity. In the root this amounts to 0.6 per cent in October and 1 per cent in February. In the stem at 10 m. level, where the highest concentrations are recorded, 0.5 per cent sucrose is found in October and 5.5 per cent in February. The reducing sugars are not found at all or only in minute traces. In the other trees both reducing sugars and sucrose were found, the latter usually predominating. In the spring the reducing sugars consisted of the hexoses and maltose, at other times the latter is absent.—In the evergreens, *Arbutus unedo* and *Ilex aquifolium*, and in the sub-evergreen, *Cotoneaster frigida*, neither great seasonal changes nor gradients from roots to crown were observed. At certain seasons the roots may have slightly higher concentrations than the stems.—*A. E. Waller.*

849. Loeb, Jacques. **Electrification of water and osmotic pressure.** Jour. Gen. Physiol. 2: 87–106. 1919.—Experimenting with the amphoteric electrolytes $Al(OH)_3$ and gelatin the author finds that water diffuses through collodion membranes into solutions of metal gelatinates or aluminates as if the water were positively charged, and into their acid salts as if it were negatively charged. The turning point for the sign of electrification of water seems to be near, or to coincide with, the isoelectric points, which is a hydrogen ion concentration about 2 times 10^{-5} N for gelatin and about 10^{-7} N for $Al(OH)_3$. When diffusing into solutions of metal gelatinates the rate is determined by the charge of the cation, the rate being approximately 2 to 3 times as great into solutions containing the monovalent cations of Li, Na, K, NH_4 as into those of the divalent cations of Ca or Ba at the same concentrations of gelatin and hydrogen ions. When diffusing into acid salts of gelatin, water—apparently negatively charged—diffuses less rapidly into a solution of gelatin sulfate than into a solution of gelatin chloride or nitrate of the same gelatin and hydrogen ion concentrations. "If we define osmotic pressure as that additional pressure upon the solution required to cause as many molecules of water to diffuse from solution to the pure water as diffuses simultaneously in the opposite direction through the membrane, it follows that the osmotic pressure cannot depend only on the concentration of the solute but must depend also on the electro-

static effects of the ions present and that the influence of ions on the osmotic pressure must be the same as that on the initial velocity of diffusion. This assumption was put to a test in experiments with gelatin salts for which a collodion membrane is strictly semipermeable and the tests confirmed the expectation."—*O. F. Curtis.*

850. Shull, C. A. **Permeability.** [Rev. of: Williams, Maud. **The influence of immersion in certain electrolytic solutions upon permeability of plant cells.** Ann. Botany 32: 591–599. 1918. (See Bot. Absts. 2, Entry 304.)] Bot. Gaz. 68: 232. 1919.

851. Stiles, Walter, and Franklin Kidd. **The comparative rate of absorption of various salts by plant tissue.** Proc. Roy Soc. London 90 B: 487–504. *Tables 1–10, fig. 1–7.* 1919. —Rate of absorption of various chlorides, sulphates, nitrates, and potassium salts from solutions 0.02N was measured by the electrical conductivity method, using discs of carrot and potato.—Initial absorption was rapid, possibly in proportion to ionic mobility. This is followed by a long period of almost logarithmic approach to equilibrium. The final quantity absorbed is independent of the initial rate in the case of any given salt.—Initial absorption rates are in the following order: Kations, K (Ca, Na), Li (Mg, Zn), Al; anions, SO_4, NO_3 Cl.—The final absorption order is, kations, K, Na, Li (Ca, Mg); anions NO_3, Cl, SO_4. Monovalent ions are at equilibrium in much greater quantity than divalent ions in the cases studied. The rate and extent of intake of one ion of a salt may be affected by the nature of the other ion. From aluminium sulphate aluminium is rapidly absorbed, and the sulphate ion slowly.—It is pointed out that there is essential agreement with other workers.—*Paul B. Sears.*

852. Thoday, D. **The "osmotic hypothesis:" a rejoinder.** New Phytol. 18: 257–259. 1919.—This is an answer to certain criticisms brought forward by Stiles and Jørgensen.—*I. F. Lewis.*

WATER RELATIONS

853. Cribbs, James E. **Ecology of Tilia americana. I. Comparative studies of the foliar transpiring power.** Bot. Gaz. 68: 262–286. *13 fig.* 1919.

854. Dosdall, Louise. **Water requirement and adaptation in Equisetum.** Plant World 22: 1–13, 29–34. *5 fig.* 1919.—See Bot. Absts. 4, Entry 217.

855. Flood, Margaret G. **Exudation of water by Colocasia antiquorum.** Sci. Proc. Roy. Dublin Soc. 15: 505–512. *2 pl.* 1919.—An inquiry into the question of whether the water exuded from the leaf-tips of *Colocasia* was conduction water, or whether it was secreted from a special gland led to the following considerations: 1. It had been related to transpiration and called a nocturnal "liquid transpiration" supplanting the diurnal vaporous one. 2. The drops were sometimes seen to be ejected for short distances, coming through small pores. 3. It had been stated that the water was secreted by a hydathode and that the secretion was simple filtration. 4. Modern observations had shown that the freezing point of the exudate differed little from distilled water, and that its electrical conductivity was less than that of tap-water.—A colloid (India ink mixed with gelatine) was successfully passed through the end pore and up into the canals, after some preliminary experimentation. When the leaf-tip was attached to a water reservoir, after severance from the leaf, drops of water continued to be exuded. This amounted to 6 cc. in 20 hours. These experiments (and the last-mentioned repeated, substituting a 0.3 per cent starch solution) prove that there was no continuous membrane between the depression and the water channels. Anaesthetizing the tip did not slow up the rate of dropping, showing that the water must be urged forward from below in the plant and not exuded by the action of the tip alone. Cutting the leaf-blade anywhere results in copious exudation from the veins at every cut. The same occurs when the petioles are cut. The conclusions from these observations and experiments, made when the soil about the plant was damp and the air saturated, is that no gland or epithem functioning in secretion is present in the leaf-tip. The phenomenon must depend upon the normal transfer of water through the plant. [See also Bot. Absts. 4, Entry 1406.]—*A. E. Waller.*

856. Shull, C. A. **Curing timber.** [Rev. of: Stone, Herbert. **The ascent of the sap and the drying of timber.** Quart. Jour. Forest. 12: 261–266. 1918.] Bot. Gaz. 68: 310. 1919. —See Bot. Absts. 5, Entry 233.

MINERAL NUTRIENTS

857. Espino, Raf. B. **Methods in nutrition experiments.** [Rev. of: Schreiner, Oswald, and J. J. Skinner. **The triangle system for fertilizer experiments.** Jour. Amer. Soc. Agron. 10: 225–246. 1918.] Plant World 22: 53–54. 1919.

858. Girard, Pierre. **Schème physique pour servir a l'étude de la nutrition minérale de la cellule.** [**Physical scheme to serve for a study of the mineral nutrition of the cell.**] Compt. Rend. Acad. Sci. Paris 168: 1335–1338. 1919.—The object of this work is to demonstrate *in vitro* the principles which bear on the differential permeability of the plasma membrane. By the use of barium chloride combined with various other chemicals, using a gold beater's skin, the author finds that differential permeability can be demonstrated. The phenomenon is explained on an electrical basis and is attributed to the ionization of the substances in solution.—*V. H. Young.*

859. Hoagland, D. R. **Relation of nutrient solution to composition and reaction of cell sap of barley.** Bot. Gaz. 68: 297–304. 1919.—The osmotic pressures in the sand and water cultures of barley are reflected in the cell sap of the tops and roots. The electrical conductivity of the nutrient solution has a marked influence on the conductivity of the sap, both in tops and in roots; the conductivity of the sap is from 4 to 50 times greater than that of the nutrient solution. The sap from the tops of plants in all cultures had almost the same P_H value, approximately 6.0. Plants were grown in 6 different soils and in every case the sap concentration was much greater than that of the soil solution. Emphasis is placed on the dynamic nature of the relation between the soil solution and the plant.—*H. C. Cowles.*

860. Le Clerc, J. A., and J. F. Breazeale. **Effect of lime upon the sodium-chlorid tolerance of wheat seedlings.** Jour. Agric. Res. 18: 347–356. *Pl. 38–47.* 1920.—The work was done with reference to "alkali" soils. Soil, sand, and solution cultures were used, since inert material might affect the toxic limits of dissolved salts. It is found that plants in soil and sand show higher tolerance to alkali salts than solution cultures. This is not due entirely to the physical effect of the presence of solid particles of different degrees of fineness, but also to certain soluble substances which are present in very small quantities.—Very small amounts of calcium oxide and calcium sulfate overcome the toxic effects of sodium chlorid and sodium sulfate. Magnesium sulfate and barium chlorid are slightly antagonistic to sodium chlorid, while potassium chlorid, sodium nitrate, sodium phosphate, ferric chlorid, and alum had no effect on its toxicity.—The presence of lime did not prevent the entrance of sodium chlorid or sodium sulfate into the plant. The antagonistic effect of lime seems to be due to some other cause than its effect on permeability.—*D. Reddick.*

861. Livingston, B. E. [Under Notes and Comment, no special title.] Plant World 22: 26–27. 1919.—A discussion of work by F. W. Gericke on a preliminary test of the influence of temperature upon the physiological balance of the nutrient solution as related to germination in wheat. Stress is laid on the need of quantitative definition of all effective conditions in experimental work.—*Chas. A. Shull.*

862. Shive, John W. **Relation of moisture in solid substrata to physiological salt balance for plants and to the relative plant-producing value of various salt proportions.** Jour. Agric. Res. 18: 357–378. 1920.—Three different degrees of moisture were maintained in sand cultures, 40, 60 and 80 per cent of the water-retaining capacity of the sand. Tests were made with 36 different sets of salt proportions of the three salts, monopotassium phosphate, calcium nitrate, and magnesium sulfate in solutions with each of the moisture percentages noted. The solutions, all having an initial total osmotic concentration of 1.75 atmospheres, were

supplied to the sand cultures in such quantities as to produce the different standards of moisture. Culture solutions were renewed every third day. Daily water loss was restored daily. Wheat was grown for 28 days.—The physiological balance of the nutrient solutions producing the best yields of tops and roots was not altered by variations in the moisture content of the sand. A slight shifting of the balance, as affecting growth, is indicated for the growth of 9 high-yielding cultures, as a whole, out of the series of 36, with each increase in the moisture content of the cultures, from a position in the series characterized by lower partial concentration of potassium phosphate to one of higher partial concentration of this salt, and correspondingly lower ones of calcium nitrate and magnesium sulfate.—Good physiological balance and optimum total concentration of a nutrient solution for plants is not alone sufficient to produce the best growth of which the solution is capable when it is diffused as a film on the particles of a solid substratum. An optimum degree of moisture is essential to impart to the soil (sand) solution its maximum physiological value. The plant-producing value of any fertilizer treatment is thus determined largely by the moisture conditions of the substratum.—The lowest percentage of moisture employed corresponds with low yields of tops and roots, lowest transpiration rates, and with lowest water requirement ratios. The highest moisture content is associated with low yield of tops and roots, with high transpiration rates, and with the highest water requirement ratios. The medium degree of moisture is correlated with the highest yields of tops and of roots, high transpiration rates, and medium water requirement ratios.—*D. Reddick.*

863. Steinkoenig, L. A. **Relation of fluorine in soils, plants and animals.** Jour. Indust. Eng. Chem. 11: 463–465. 1919.—After reviewing the literature the author reports fluorine determinations of 9 soils, using Merwin's determination with modifications, which is given in detail. Fluorine occurs in amounts averaging 0.03 per cent. Three soils contained but 0.01 per cent, and in one case it was not found. Soils carrying stones made up of mica schist contain relatively higher amounts,—Hagerstown loam 0.11–0.15 per cent, York silt loam 0.05 per cent. Fluorine is in the soil in such minerals as biotite, tourmaline, muscovite, apatite, fluorite and phlogopite. Plants absorb fluorine and thus it is available for animals, which latter may also obtain it from spring water. [See also Bot. Absts. 4, Entry 1636.]—*C. R. Hursh.*

864. Stiles, Walter, and Franklin Kidd. **The influence of external concentration on the position of the equilibrium attained in the intake of salts by plant cells.** Proc. Roy. Soc. London 90 B: 448–470. *Tables 1–13, 6 fig.* 1919.—Salt intake by discs of carrot and potato tissue was measured by changes in electrical conductivity of the external solution. The initial concentrations used varied from N/10 to N/5000. Carrot is considered more suitable than potato because of less exosmosis into distilled water. Toxic salts, e. g., copper sulfate, produce greater exosmosis in both distilled water and in solutions.—The ratio between final internal and final external concentration is called the absorption ratio. The initial rate of absorption is roughly proportional to the concentration of the external solution; but the final absorption ratio, at equilibrium, diminishes as concentration of the external solution increases. The equation of the absorption ratio is given as $y = KC^m$, where y is the final interval and C the final external concentration. This happens to be the adsorption equation, but no basis was found for postulating the mechanism of salt intake.—*Paul B. Sears.*

PHOTOSYNTHESIS

865. Pulling, H. E. **Physiological problems of photosynthesis.** [Rev. of: Henrioi, Marguerite. **Chlorophyllgehalt und Kohlensäure-Assimilation bei Alpen- und Ebenenpflanzen.** Verhandl. Naturforsch. Ges. Basel 30: 43–136. 1918.] Plant World 22: 123–126. 1919.

METABOLISM (GENERAL)

866. Armstrong, E. Frankland. **The simple carbohydrates and the glucosides.** 3rd ed. *IX+239 p.* Monographs on Biochemistry. Longmans, Green & Co.: London, 1919.—No new chapters have been added since the second edition of this work, but much new material

has been incorporated. Important among the special advances necessitating the revision are (1) the discovery of a third isomeric form of glucose differing from the pentaphane ring forms in structure serving to throw new light on the constitution of sucrose, and (2) definite data for the characterization of carbohydrates as regards the relationship of optical rotatory power to structure.—*B. M. Duggar.*

867. Ayers, S. Henry, and Philip Rupp. **Simultaneous acid and alkaline bacterial fermentations from dextrose and the salts of organic acids respectively.** Jour. Infect. Diseases 23: 188–216. 1918.—The quantitative fermentation of dextrose by *Bacillus coli* and *B. aerogenes* into formic, acetic, lactic, and succinic acids is shown, with the accompanying changes in H-ion concentration. The reversion of reaction is explained as the formation of carbonates or bicarbonates from the formic acid salts, as the changes in P_H agree quite closely with the disappearance of the formic acid. Simultaneous fermentations of acid from dextrose and of alkali from citrate are shown with the alkali-forming group of bacteria.—*W. H. Chambers.*

868. Behrend, Robert, and George Heyer. **Über die Oxydation der Muconsäure. Synthese der Schleimsäure.** [Concerning the oxidation of muconic acid. Synthesis of mucic acid.] Ann. Chem. 418: 294–316. 1919.—As an average of 12 tests under controlled conditions the action of potassium permanganate upon muconic acid yielded, per 100 molecules of the acid, 21 molecules of oxalic acid, 11 molecules of tartaric acid, a trace of mucic acid, and unidentified products. Oxidation by sodium chlorate and osmic acid yielded, per 100 molecules, 32 molecules of mucic acid and small amounts of other products.—*W. E. Tottingham.*

869. Besson, A., A. Ranque, and C. Senez. **Action biochimique des microbes sur les sucres et les alcools.** [Biochemical action of bacteria on sugars and alcohols.] Compt. Rend. Soc. Biol. 81: 930–933. 1918.—Fermentation of the common sugars and alcohols by bacteria of the colon-typhoid-dysentery group and other organisms is tabulated, with emphasis on the constancy of the property of gas production.—*W. H. Chambers.*

870. Besson, A., A. Ranque, and C. Senez. **Sur la vie du coli-bacille en milieu liquide glucosé.** [On the life of B. coli in liquid glucose-containing media.] Compt. Rend. Soc. Biol. 82: 76–78. 1919.—The time relation between growth and fermentation is shown. Gas and acid production commenced when multiplication ceased. More than one-half of the acid was produced in the first hour.—*W. H. Chambers.*

871. Besson, A., A. Ranque, and C. Senez. **Sur la vie des microbes dans les milieux liquides sucrés.** [On the life of bacteria in liquid sugar-containing media.] Compt. Rend. Soc. Biol. 82: 107–109. 1919.—The action of different bacteria on glucose is shown to be similar to that of *Bacillus coli*, the cultures becoming sterile in 6 days. The acid and gas production of *B. coli* from different sugars and alcohols is reported.—*W. H. Chambers.*

872. Besson, A., A. Ranque, and C. Senez. **Sur la vie du coli-bacille en milieu liquide glucosé. Importance des doses de glucose.** [On the life of Bacillus coli in liquid glucose-containing media. Importance of amounts of glucose.] Compt. Rend. Soc. Biol. 82: 164–166. 1919.—The relation of amounts of glucose to titratable acid, death of the culture, disappearance of the sugar, and time of gas fermentation is reported. They found reversion of reaction with 0.2 per cent or less of glucose, and death of the culture in 6 days with 0.4 per cent or more. —*W. H. Chambers.*

873. Bourquelot, E., and Bridel. **Application de la methode biochemique a l'étude de plusieurs d'Orchidées indigènes. Découverte d'un glucoside nouveau, la "loroglossine."** [Discovery of a new glucoside, "loroglossine," in one of the indigenous orchids.] Compt. Rend. Acad. Sci. Paris 168: 701–703. 1919.—Preparation and properties of the glucoside "loroglossine" from *Loroglossum hircinum* Rich. are described.—*F. B. Wann.*

874. Bunker, J. W. M. **The determination of hydrogen ion concentration.** Jour. Biol. Chem. 41: 11–14. 1920.—An electrode and a vessel are described which have been in use a long time, meeting the requirements of quick, accurate determinations in large numbers.—*G. B. Rigg.*

875. Church, A. H. **The ionic phase of the sea.** New Phytol. 18: 239–247. 1919.—This is a discussion of sea water as the "primary source of 'life'" from the standpoint of the modern physico-chemist. The ionization of the salt content of sea water is discussed, particularly in relation to the ions of carbonic acid. Far-reaching analogies are pointed out between living substance and sea water; the latter is even considered to be "the primordial material of which protoplasmic units are but individualized particles or segregated centres of actions, still more complex, but of the same category."—*I. F. Lewis.*

876. Clevenger, Clinton B. **Hydrogen-ion concentration of plant juices. I. The accurate determination of the hydrogen-ion concentration of plant juices by means of the hydrogen electrode.** Soil Sci. 8: 217–226. 1919.—The apparatus is essentially that described by Clark and Lubs with modifications to prevent foaming of the plant juice and to simplify both the shaking apparatus and the temperature. To prevent contact between the electrodes and plant juice during saturation with hydrogen the juice is placed in dropping funnels attached to the electrode vessels. To reduce contact potential, contact between the plant juice and the saturated potassium chloride solution is made by means of a scratch around the cock connecting the two. Duplicate measurements agree within 0.1 millivolt.—*William J. Robbins.*

877. Clevenger, Clinton B. **Hydrogen-ion concentration of plant juices. II. Factors affecting the acidity or hydrogen-ion concentration of plant juices.** Soil Sci. 8: 227–242. 1919.—Determinations of acidity should be made as quickly as possible after cutting the plant and extracting the juice, as the acidity of plant juice may decrease or increase on standing. The roots of cow pea are generally more acid than the leaves and the leaves more acid than the stems. The acidity in the roots of cow pea during a 24 hour period is rather constant, being higher during the day. In the leaves and stems the acidity drops during the afternoon, rising during the night and reaching a maximum in the morning. The acidity of the roots of plants appears to be correlated with the reaction of the soil, but the acidity of the tops of the plants studied was greater on limed than on unlimed soil.—*William J. Robbins.*

878. Colin, H. **Utilization du glucose et du levulose par les plantes supérieures. [Utilization of glucose and levulose by higher plants.]** Compt. Rend. Acad. Sci. Paris 163: 697–699. 1919.—The proportion of glucose to levulose in green leaves of beet is often less than 1, but increases down the midrib and in the petiole. Etiolated leaves of beet, artichoke, and chicory showed a larger proportion of dextrose than of levulose, whereas in the storage organs of these plants the reverse is true. It is assumed that these two sugars must either be transported at unequal rates or that they are utilized in unequal amounts. The author concludes that it is more probable that the glucose is oxidized in the cell in preference to levulose, the latter playing an essential rôle in tissue formation. Thus respiration is less intense in the petiole than in the blade, and less in etiolated leaves than in green leaves.—*F. B. Wann.*

879. Cushny, Arthur R. **The properties of optical isomers from the biological side.** Pharm. Jour. 103: 483. 1919.—The living plant discriminates between laevo and dextro-rotatory bodies because it is itself optically active, but no optically active substances have as yet been synthetically produced by man. Because of this phenomenon of discrimination by the living plant and the fact that an optically active alkaloid, such as cinchonine, can be used to separate a mixture of laevo and dextro tartrates, and the further fact that vegetable and animal organisms that act upon asymmetric bodies generally destroy the substance that occurs in nature but will not destroy the non-natural isomer, the author declares that "until life appeared no optically active body existed, and without life and its products there would be none today." Further, this optical activity is the most persistent evidence of life, since an

optically active alkaloid or acid, centuries after the plant that produced it is destroyed, will still retain its activity, and the occurrence of any optically active substance, such as petroleum, proves that it must have been derived from living tissues.—Experiments with hyoscyamine, a laevorotatory substance and its isomer atropine, optically inactive, consisting of equal parts of laevo and dextro hyoscyamine, demonstrated that *l*-hyoscyamine had the same physiological effect on peripheral nerve-endings as twice the quantity of *dl*-hyoscyamine (atropine). Again, a comparison, by the effect on blood pressure, indicates that natural adrenaline (*l*-adrenaline) was twice as powerful as synthetic adrenaline (*dl*-adrenaline) and that *d*-adrenaline (obtained from *dl*-adrenaline) was without activity.—*E. N. Gathercoal.*

880. Haas, A. R. C. **The electrometric titration of plant juices.** Soil Sci. 7: 487–491. *1 fig.* 1919.—An electrometric apparatus is described for determining the buffer action, acid and alkali reserve, and the total and actual acidities of plant juices. Rhubarb juice has a greater actual acidity and greater buffer action than that of soy bean tops.—*William J. Robbins.*

881. Haynes, Dorothy, and Hilda Mary Judd. **The effect of methods of extraction on the composition of expressed apple juice, and a determination of the sampling error of such juices.** Biochem. Jour. 13: 272–277. 1919.—See Bot. Absts. 5, Entry 541.

882. Jones, Harry. **Some factors influencing the final hydrogen-ion concentration in bacterial cultures with special references to streptococci.** Jour. Infect. Diseases 26: 160–164. 1920.—The composition of the medium, the initial reaction and any other conditions which favor or hinder abundant growth of a given organism should be considered in order to obtain accurate information regarding its final hydrogen ion concentration.—*Selman A. Waksman.*

883. Knudson, L., and E. W. Lindstrom. **Influence of sugars on the growth of albino plants.** Amer. Jour. Bot. 6: 401–405. 1919.—Albino corn seedlings grown both on agar and in water culture were supplied with sugar (sucrose and glucose). On agar, they all lost weight, but those supplied with sugar lost considerably less than controls which had no sugar. Results with plants grown in the dark were essentially the same as with those grown in the light. In water culture the albino seedlings made an appreciable gain when provided with sugar, and lived much longer than the controls, but ultimately died. The better growth in water culture is explained as probably due to higher concentration of sugar and higher temperatures at which the plants were grown. Roots of plants supplied with sugar often continued to live for some time after the shoots died. The substitution of asparagin for nitrates in the culture solutions caused practically no difference in growth. The authors explain the failure of albino plants to thrive when sugar is supplied as due to the inability of the plant to absorb sugar rapidly, and to the relatively slow rate of its conduction.—*E. W. Sinnott.*

884. Kremers, R. E., and J. A. Hall. **On the identification of citric acid in the tomato.** Jour. Biol. Chem. 41: 15–17. 1920.—The presence of citric acid in the tomato has been shown by means of its triphenacyl ester.—*G. B. Rigg.*

885. Meinicke, E. **Die Lipoidbindungsreaktion. [The lipoid-fixation reaction.]** Zeitschr. Immunitätsforsch. u. Exp. Therapie 27: 350–363. 1918; 28: 280–326. 1919.—Antibodies are probably globulins, or at least inseparable from them by any known method. In the reaction between serum and the extract, the colloids of the latter force the NaCl equivalent of the serum globulins from solution, probably by removing NaCl. This reaction is stronger in positive sera. An immunized organism reacts more quickly and more intensively following a recent addition of antigen than the control. The possibility of a specific, more intensive reaction resides not only in the cell but also in the serum itself. The intensity of the reaction seems due to the fact that the NaCl equivalent of the most labile substance in the system is forced out of solution by the most stable substance present. The various forms of immunity reactions are only the expression of the different reagents acting in various combinations in such a system, hence it is possible to combine various forms of reactions. In the so-called

inactivation of sera the reaction possibilities of the serum globulins are changed in two ways: it is separated from the NaCl equivalent with more difficulty; and the salt removal acts on the protein molecule itself, as is seen in the closer binding of the salt on warming the sera.—*C. W. Dodge.*

886. Morishima, Kanichiro. **Phenol red-china blue as indicator in fermentation tests of bacterial cultures.** Jour. Infect. Diseases 26: 43–44. 1920.—An indicator is proposed consisting of phenol red and decolorized china blue for fermentation tests of bacterial cultures. The production of acid causes first a bright green color changing to a deep blue, when too much acid is formed. The production of alkali is indicated by a pink color.—*Selman A. Waksman.*

887. Posternak, M. S. **Sur la constitution du principe phospho-organique de réserve des plantes vertes. [On the constitution of the phospho-organic principle in the reserve of green plants.]** Compt. Rend. Acad. Sci. Paris 169: 37–42. 1919.—An attempt is made to determine whether or not the phospho-organic reserve of plants is or is not a hexa-phosphate of inosite. The author plans experiments on the synthesis of this compound to determine whether or not 3 molecules of water are held as water of crystallization or are an essential constituent of the molecule.—*V. H. Young.*

888. Sherman, H. C. **Protein requirement of maintenance in man and the nutritive efficiency of bread protein.** Jour. Biol. Chem. 41: 97–109. 1920.—The proteins of wheat, corn, and oats appear to be about equally efficient in human nutrition, and need only be supplemented by small amounts of milk in order to be fully as efficient as the proteins of ordinary mixed diets.—*G. B. Rigg.*

889. Steenbock, H., and P. W. Boutwell. **Fat-soluble vitamine. III. The comparative value of white and yellow maizes.** Jour. Biol. Chem. 41: 81–96. *pl. 2.* 1920.—The occurrence of yellow pigment and the growth-promoting property attributed to the presence of the fat-soluble vitamine seem to be intimately associated in the maize kernel.—*G. B. Rigg.*

890. Willaman, J. J. **The function of vitamines in the metabolism of Sclerotinia cinerea.** Jour. Amer. Chem. Soc. 42: 549–585. 1920.—The basal medium for these tests was Currie's mineral solution plus asparagin (as a source of nitrogen), plus sucrose. Growth was completed in 10 days; sporulation began the third or fourth day. "The amount of vegetation is not proportional to the concentration of the juice, the fungus being unable to utilize the greater amounts of nutrients in the same degree that it does the lesser." "Reproduction is more abundant on the peach juice than on the others," i.e., prune juice and apricot juice. "The higher concentrations are not necessarily the optimum for reproduction." The fungus can make excellent growth on either asparagine or glycine, providing the growth-promoting material of the 2 cc. of prune juice is also present. It was also shown that diammonium hydrogen phosphate alone would not produce growth; that wort alone will support growth fairly well; and the two together make an excellent medium for growth. The vitamine preparation served to make the ammonia nitrogen more useful to the fungus. Vitamine B was obtained by means of Lloyd's alkaloidal reagent. It adsorbs the vitamine from an acid solution and releases it in an alkaline one Pectin interferes with the adsorption of the vitamine. 65 per cent alcohol, to which a few drops of 1 per cent H_2SO_4 was added, was used for the preparation of the vitamine. When pectin has been removed, the vitamine will pass through a colloidin sac.—The author presents evidence that two vitamines are concerned in the life cycle of *Sclerotinia cinerea.* One enables vegetative growth to take place and is more readily adsorbed by Fuller's earth on an alcohol medium; the other enables the fungus to sporulate well and is more readily adsorbed in an aqueous medium. Evidence given shows that the shuffling of the nitrogen and sugar constituents of the medium will not of itself determine the occurrence or non-occurrence of reproduction in *Sclerotinia.* Both vitamines must be present if reproduction is to occur. Other evidence presented would indicate the presence of but one vitamine.—*J. M. Brennan.*

891. Willaman, J. J. **Colorimeter and indicator method.** [Rev. of: Duggar, B. M., and C. W. Dodge. **The use of the colorimeter in the indicator method of H-ion determination with biological fluids.** Ann. Missouri Bot. Gard. 6: 61–70. 1919. (See Bot. Absts. 4, Entry 1449.)] Bot. Gaz. 68: 232. 1919.

892. Zellner, Julius. **Zur Chemie der höheren Pilze. XIII. Über Scleroderma vulgare Fr. und Polysaccum crassipes DC.** [**Chemistry of the higher fungi.**] Akad. Wiss. Wien (Monatshefte für Chemie) 39: 603–615. 1918.—Following the general plan of his earlier studies the author reports the presence of mannit, cholin, and viscosin among the substances investigated in *Scleroderma*. In *Polysaccum* it is noteworthy that no mannit occurs. With this species special attention was devoted to a tannoid pigment. In neither fungus could the author demonstrate either invertase, maltase, or diastase.—*B. M. Duggar.*

893. Zoller, H. F. **Quantitative estimation of indole in biological media.** Jour. Biol. Chem. 41: 25–36. 1920.—Indole is an important product of the metabolism of certain microorganisms. A simple, rapid, reliable method for its determination has been evolved, requiring only the reagents and apparatus common to most laboratories.—*G. B. Rigg.*

894. Zoller, H. F. **Influence of hydrogen ion concentration upon the volatility of indole from aqueous solution.** Jour. Biol. Chem. 41: 37–44. 1920.—The range of most rapid volatilization of indole from the aqueous solutions studied is from P_H 8.0 to 10.5. Results suggest that the practice of steam distillation can be supplanted by direct distillation when the reaction of the solution is taken into account.—*G. B. Rigg.*

METABOLISM (NITROGEN RELATIONS)

895. Anonymous. [Rev. of: Lakon, Georg. **Der Eiweissgehalt panachierter Blätter, geprüft mittels des makroskopischen Verfahrens von Molisch. (The protein content of mottled leaves tested by the macroscopical method of Molisch.)** Biochem. Zeitschr. 78: 145–154. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 251. 1918.—White-variegated leaves of many species of plants, especially, *Acer negundo*, furnish suitable material for the macroscopical demonstration of the protein reaction according to Molisch. The protein-rich green places in the leaves give a very strong color while the protein-poor albescent places are only slightly colored. Protein-rich and protein-poor places are directly related to the presence and absence of chromatophores, in the leaf. In the case of yellow 'panachierten,' chromatophores are found in the leaf tissues and so one finds them rich in protein. The investigation supports the views of Molisch in that the principal masses of proteins of the leaves occur in the chromatophores. When submitted to the xanthoproteic reaction leaves which contain anthocyanin first take on a red color when placed in nitric acid solution, because, in spite of the decolorization, they contain anthocyanin in the colorless isomeric form.—*F. M. Schertz.*

896. Berman, N., and L. F. Rettger. **Bacterial nutrition: further studies on the utilization of protein and non-protein nitrogen.** Jour. Bact. 3: 367–388. 1918.—The utilization of different brands of commercial peptones by proteolytic and non-proteolytic bacteria is probably related to the simpler nitrogen-containing substances. The liquefaction of gelatin was not a necessary indication of the proteolytic property of an organism. The availability of casein for bacterial use is shown before and after digestion with trypsin.—*W. H. Chambers.*

897. Bonazzi, Augusto. **On nitrification. III. The isolation and description of the nitrite ferment.** Bot. Gaz. 63: 191–207. *pl. 14.* 1919.—This paper presents the results of the study of an organism, capable of forming nitrates from ammonia, isolated in a pure state from Wooster [Ohio] soil after many unsuccessful attempts. A review is given of the pertinent literature, and the methods are described by which the organism was isolated and its cultural characteristics determined. The cultural solution used throughout was the one recommended by Omelianski, of the following composition: H_2O, 1000 cc.; $FeSO_4$, 0.4 gram; $MgSO_4$, 0.5 gram; K_2HPO_4, 1 gram; NaCl, 2 grams; and $(NH_4)_2SO_4$, 2 grams. Solid media

used were gypsum block, magnesium carbonate block, magnesium carbonate and ammonium-magnesium-phosphate block, ammonium sulphate washed agar, and silicic acid jelly. The best results were obtained with Winogradsky's silicic acid jelly. Incubation of all cultures was made at 28 to 30°C. At this temperature cultures were obtained which nitrified as much as 8.04 mgm. of ammoniacal nitrogen in 26 days of incubation. The organism is not motile. Its thermal death point was found to lie between 50° and 55°C., when the vitality of the organism, after heating 5.5 minutes at the required temperature, was tested at rest in Omeliansky's solution containing basic magnesium carbonate. The organism occurs in a large form $=1.25\mu$ in diameter and in a small coccus form which the author names β. He concludes that the megalococcus isolated by these methods is very similar to that described by Winogradsky from South American soils and should be classed as a species of the genus *Nitrosococcus*.—*D. H. Rose.*

898. Brackett, R. N., and H. F. Haskins. **Report on nitrogen.** Jour. Assoc. Official Agric. Chem. 3: 207–217. 1919.—See Bot. Absts. 5, Entry 1003.

899. Conn, H. J., and J. W. Bright. **Ammonification of manure in soil.** Jour. Agric. Res. 16: 313–350. 1919.—A foreword by Conn refers largely to previous studies of spore-formers and non-spore-formers. Under the title "What soil organisms take part in ammonification of manure?" Bright shows the predominance of *Pseudomonas fluorescens* and *Pseudomonas caudatus* in manured soil and gives the results of an investigation of their function in Dunkirk silt clay loam.—Fresh horse or cow manure was added to the soil in the ratio of 1:20. In addition to plate counts direct microscopic examinations were made. Not only was the unsterilized material used but also the sterilized to which was added the pure cultures. The latter was used both separately and in combination.—In unsterilized soil which was kept in pots the data show a rapid increase in non-spore-formers. After 7 days they were never less than 92.5 per cent, while in certain cases they were as high as 97 per cent. The results from experiments conducted in flasks are not so striking, yet the same relation holds. Isolations showed only 2.8 per cent which form spores.—The growth of *Ps. fluorescens* and *Ps. caudatus* in sterilized manured soil compared with that of a spore-former, *Bacillus cereus*, shows that the spore-former had increased in 7 days only 8.3 times while the two former organisms had increased respectively 110 and 132 times over the original inoculation. When these three organisms were in association *Ps. fluorescens* and *Ps. caudatus* rapidly gained the ascendancy over *B. cereus*, the latter soon sporulating and remaining in this condition.—A test of the ammonia production and cell count in soil of the above three organisms in pure culture shows *B. cereus* to be the most powerful ammonifier. The two non-spore-forming organisms gave many times more cells per gram of manured soil. However, when the three organisms were grown in association there was no increase in total ammonia formed and in cell counts the two non-spore-formers had gained the ascendancy. *B. cereus* was not found although 2.3 million per gram were present at the beginning.—The taxonomic study by Conn includes a description of *Ps. fluorescens*, *Ps. aeruginosa*, *Bacterium termo* and *Ps. putida* with a brief summary of characters of typical *Ps. fluorescens* and *Ps. caudatus*.—*J. K. Wilson.*

900. Dakin, H. D. **On amino acids.** Biochem. Jour. 12: 290–317. 1918.—Some new methods are presented for the extraction of amino acids by partially miscible solvents. A new amino acid, hydroxyglutanic acid, and a new peptide from caseinogen, isoleucylvaline, have been isolated and studied.—*W. H. Chambers.*

901. Frear, William, Walter Thomas, and H. D. Edmiston. **Notes on the use of potassium permanganate in determining nitrogen by the Kjeldahl method.** Jour. Assoc. Official Agric. Chem. 3: 220–224. 1919.—See Bot. Absts. 5, Entry 1005.

902. Hendrick, Ellwood. **Micro-organisms in plant chemistry and nitrogen fixation. An account of the development and application of micro-organisms useful to plant growth—fixation of nitrogen in the soil.** Chem. and Mettallurg. Eng. 19: 574–576. *6 fig.* 1918.—This is

a popular account of the utilization of a muck swamp, and among the products described is that designated "inoculant"—a material in which 28 strains of legume bacteria and 5 strains of *Azotobacter* are grown.—*G. M. Armstrong.*

903. Hirsch, Paul. **Die Einwirkung von Mikroorganismen auf die Eiweisskörper. [The action of micro-organisms on proteins.]** *IX+255 p., 7 fig.* Die Biochemie in Einzeldarstellungen IV [Edited by A. Kanitz]. Gebrüder Borntraeger: Berlin, 1918.—This number in the above biochemical series is essentially an amino acid reference book and follows naturally No. III, by M. Siegfried, on partial protein hydrolysis ("Über partielle Eiweisshydrolyze"). This monograph takes up the secondary cleavages of the proteins, the decomposition of the amino acids. The first part discusses the chemistry of the amino acids and of their proteolysis by bacteria and fungi, with one section on ergot. Part 2 gives chemical and biological methods for isolating and determining the amino acid cleavage products. Part 3 gives the physical and chemical properties of the products and their derivatives, and part 4, the synthesis of some of them.—*W. H. Chambers.*

904. Holm, George E. **A modification of the apparatus for the determination of arginine nitrogen by Van Slyke's method.** Jour. Amer. Chem. Soc. 42: 611–612. 1920.

905. Levene, P. A. **The structure of yeast nucleic acid. V. Ammonia hydrolysis.** Jour. Biol. Chem. 41: 19–23. 1920.—On mild hydrolysis with 5-per cent ammonia at a temperature of 100°C. yeast nucleic acid is broken up into four nucleotides. Three have already been reported. A fourth, crystalline cytidinphosphoric acid, has now been isolated.—*G. B. Rigg.*

906. Long, Esmond R. **A study in fundamentals of the nutrition of the tubercle bacillus: the utilization of some amino acids and ammonium salts.** Amer. Rev. of Tuberculosis 3: 86–108. *2 fig.* 1919.—The experiments performed are concerned primarily with the growth of human tubercle bacilli on media of known chemical composition. The hydrolysis of proteoses and peptones, as also the deaminization of some of the constituent amino acids, is reported. Good growth was afforded by glycerol media with urethane, glycocoll, and alanine as sources of nitrogen; likewise ammonia, methyl amine, and ethyl amine, as also the acid amids, were utilized. Ammonium salts of the dibasic acids oxalic, malonic, succinic, malic, and tartaric afforded excellent growth, but the ammonium salts of fatty, ketonic, and hydroxy acids did not permit growth. Between P_H 6.4 and P_H 7.8 the reaction of a glycerol peptone culture medium is unimportant in the growth of this organism. Regarding the course of catabolism, it is suggested that "the amino acids (that is, those studied—glycocoll and alanine) break up into ammonia and alcohols, perhaps with amines as intermediate stages, that hydroxy malonic acid (tartaric acid) is formed in the medium through the oxidation of glycerol, and that ammonium malonate and malonic ester, or closely allied compounds, are of great importance in the synthesis of the bacillus's organic substance."—*B. M. Duggar.*

907. Phelps, I. K., and H. W. Daudt. **Investigations of the Kjeldahl method for the determination of nitrogen.** Jour. Assoc. Official Agric. Chem. 3: 218–220. 1919.—See Bot. Absts. 5, Entry 1006.

908. Trowbridge, P. F. **Symposium on the determination of nitrogen in fertilizers.** Jour. Assoc. Official Agric. Chem. 3: 217–218. 1919.—See Bot. Absts. 5, Entry 1007.

METABOLISM (ENZYMES, FERMENTATION)

909. Anonymous. **Glycerin manufacture by the fermentation of sugar.** Sci. Amer. Supplem. 88: 315. 1919.—[From *Engineering*, Sept. 5, 1919.]—A method employing yeasts.—*Chas. H. Otis.*

910. Anonymous. [Rev. of: Biedermann, W. **Fermentstudien. 1. Mitteilung. Das Speichelferment. (Salivary ferments.)** Fermentforschung 1: 385–436. 1916.] Biedermann's Zentralbl. Agrikulturchem. 47: 279–280. 1918.—The reviewer credits the author with finding

that the time required for the hydrolysis of starch to dextrine under the action of salivary ferments is conversely proportional to the quantity of ferment. Saccharification is in no way parallel to dextrin formation but remains behind if the quantity of ferment is decreased. It is believed that the diastase enzyme consists of two components; an amylase which splits the starch molecule to dextrine, and a dextrinase which can attack only the dextrin group.—*F. M. Schertz.*

911. Anonymous. [Rev. of: Biedermann, W. **Fermentstudien. II. Mitteilung. Die Autolyse der Stärke.** (**The autolysis of starch.**) Wochenschr. Brauerei 34: 183–186. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 280–281. 1918.—The reviewer indicates that previous work of Biedermann shows the rapid hydrolysis of boiled starch solution by saliva ash, which effect is due to a ferment liberated from the starch. It is now shown, according to the reviewer, that a similar hydrolysis occurs without adding any ash, if the starch solution is made at 70–90°C. Boiled solutions are hydrolyzed after a longer period, while extracts prepared by grinding starch in water hydrolyze rapidly. The diastatic power of the latter extract is similar to that of a very dilute solution of saliva, and completely transforms starch into sugar. Of the salivary salts calcium chloride promotes maximum diastatic action. The action of salivary ash in promoting the decomposition of starch solutions which have been subjected to boiling suggests that this mixture of salts promotes the formation of amylase from starch.—*F. M. Schertz.*

912. Anonymous. [Rev. of: Jacoby, Martin. **Über Fermentbildung.** (**Formation of enzymes.**) Biochem. Zeitschr. 79: 35–50. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 281–282. 1918.—Traces of grape sugar were found to greatly increase the activity of enzymes on urea. Search was then made to see what building stones the enzymes used. According to the reviewer there were then tested a number of materials in relation to their action on the decomposition of urea. The formation of urease was greatly stimulated by d-glucose, d-galactose, glycerol, dl-glyceric aldehyde, dihydroxy acetone, pyroracemic acid, and lactic acid. A stimulatory action of less intensity was shown by d-fructose, d- and l-arabinose. Maltose, ethylene glycol, and propylene glycol produced little action, while d-mannose, d-sorbose, rhamnose, heptose, the polysaccharides, glucosides, and sugar alcohols had no action.—*F. M. Schertz.*

913. Anonymous. [Rev. of: Lombbroso, Ugo. **Über die Reversibilität der Enzymwirkungen. 1. Mitteilung. Spaltung und Synthesis der Fette durch eine Lipase.** (**Cleavage and synthesis of fats by the action of one and the same lipase.**) Arch. Pharmacol. Sperim. 14: 429–459. 1912.] Biedermann's Zentralbl. Agrikulturchem. 47: 287. 1918.—According to the reviewer it is shown that fat hydrolysis begins immediately at 37°C. and can proceed to 80 per cent of completion. Synthesis does not begin till after 30–40 hours and then does not proceed to a very great extent. The presence of bile neither increases nor retards the synthesis of fat but increases the hydrolysis. Warming at 40°C. for several hours destroys the lipolytic properties but the synthetic activities are not affected. The presence of glycerin lessens the harmful action of heat while oleic acid has no influence. The synthetic power of pancreatic juice is not increased if either glycerin or oleic acid remains in contact with it for a long time. Pancreatic juice which possesses synthetic properties has only small lipolytic capacities. Addition of fat slows down the synthetic activities but does not inhibit them. No synthesis could be demonstrated with the secretion of the small intestine in spite of a well developed lipolytic property.—*F. M. Schertz.*

914. Anonymous. [Rev. of: Schweizer, Karl. **Zur Kenntnis der Desaminierung.** (**Deamination.**) Biochem. Zeitschr. 78: 37–45. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 282. 1918.—The setting free of ammonia (deamination) in the final stages of protein decomposition has been ascribed to the action of deaminases which, however, have not been isolated. A hydrolytic action was ascribed to the deaminase. Chodat and Schweizer in 1913 showed that tyrosinase possessed deaminizing properties and that deamination may

be due to the oxidizing function of this enzyme. The author isolated tyrosinase from the potato and studied its action upon the amino acids. He detected formaldehyde, ammonia, and small quantities of carbon dioxide as decomposition products. He found that the presence of chlorophyll favored the action of tyrosinase. No deamination occurred when the oxygen was displaced by hydrogen or carbon dioxide. The author shows that the oxidizing ferment tyrosinase has the ascribed properties of the deaminase and so makes the existence of a deaminate doubtful.—*F. M. Schertz.*

915. Barton, Arthur Willis. **The lipolytic activity of the castor and soy bean.** Jour. Amer. Chem. Soc. 42: 620–632. 1920.—The author finds that the lipase from the castor bean splits the esters of fatty acids to a greater degree than does the soy bean lipase. Both seeds contain the same lipases. When lard or olive oil is used as substrate, ether and alcohol must be added before titration. Lipases from both sources act in the same ranges of acidity.—*J. M. Brannon.*

916. Carnot, P., and P. Gerard. **Mécanisme de l'action toxique de l'urease.** [Mechanism of the toxic action of urease.] Compt. Rend. Acad. Sci. Paris 169: 88–90. 1919.—There are reported experiments *in vitro* and *in vivo* using the urease of soy beans, and an explanation is given of the toxic action of soy beans on the basis of the action of the urease contained in them.—*V. H. Young.*

917. Colin, H., and A. Chaudun. **Sur la loi d'action de la sucrase. Influence de la viscosité sur la vitesse d'hydrolyse.** [On the law of action of sucrase: influence of viscosity on the rate of hydrolysis.] Compt. Rend. Acad. Sci. Paris 168: 1274–1276. 1919.—If saccharose is in excess with relation to the enzyme sucrase, the rate of hydrolysis is proportional to the viscosity of the solution.—*V. H. Young.*

918. Hérissey, M. H. **Sur la conservation du ferment oxydant des champignons.** [The preservation of the oxidizing ferment (oxydase) of fungi.] Jour. de Pharm. et Chim. 20: 241–245. 1919.—The oxydases of fungi, especially of *Russula delica*, can easily be preserved in macerations with glycerin (1 part of the sliced fungus and 2 parts of glycerin). They may also be obtained by adding ether to the sliced fungus, allowing the mixture to stand for some time and then drawing off the lower aqueous liquid and keeping this together with an equal volume of ether, water, or glycerin in sealed tubes. The oxydases thus remain intact for more than 20 years and form a very important reagent for biologic tests.—*H. Engelhardt.*

919. Jacoby, M. **Über den vermeintlichen Abbau der Stärke durch Formaldehyde.** [The supposed decomposition of starch by formaldehyde.] Ber. Deutsch. Chem. Ges. 52B: 558–562. 1919.—Formaldehyde action on starch has no relation to diastatic action; that is, formaldehyde is not a "diastase-model." The author disagrees with Woker and agrees with von Kauffman and Sallinger on this point.—*G. M. Armstrong.*

920. Kopeloff, Nicholas, and S. Byall. **Invertase activity of mold spores as affected by concentration and amount of inoculum.** Jour. Agric. Res. 18: 537–542. 1920.—Spores of *Aspergillus Sydowi*, *A. niger*, and *Penicillium expansum* exhibit invertase activity in sugar solutions of concentrations varying from 10 to 70 per cent. Maximum activity occurs in concentrations between 50 and 60 per cent. An increase in the number of spores results in an increased invertase activity in a saturated sugar solution. About 5000 spores of *A. Sydowi* per cubic centimeter of saturated sugar solution cause inversion; but from 50,000 to 110,000 spores per cc. of the other two organisms are required.—*D. Reddick.*

921. McHargue, J. S. **The significance of the peroxidase reaction with reference to the viability of seeds.** Jour. Amer. Chem. Soc. 42: 612–615. 1920.—The author thinks that the peroxidase reaction can be made use of in seed-testing laboratories for detecting non-viable seeds and for distinguishing between seed of high, medium, and low viability. Lettuce, alfalfa, and soy-bean seeds contain both oxidases and peroxidases. The peroxidase can be used to determine the rate at which seeds lose their viability.—*J. M. Brannon.*

922. Myers, R. C., and L. C. Scott. **Salivary amylase. I. A preliminary experimental study of its stability in saliva.** Jour. Amer. Chem. Soc. 40: 1713-1716. 1918.—Salivary amylase, sterilized by being passed through a Berkefeld filter, is relatively stable for one year with or without such preservatives as toluene, thymol, and chloroform; nevertheless, the preservatives mentioned are in a measure destructive, and in the order mentioned, beginning with the least destructive.—The causes which lower the stability of salivary amylase are not solely organisms and preservatives. The inherent chemical weakness of the enzyme molecule must be taken into account. Temperatures from 18 to 30°, light, and certain compounds in the saliva increase this weakness.—*C. R. Hursh.*

923. Northrup, John H. **Combination of enzyme and substrate. I. A method for the quantitative determination of pepsin. II. The effect of the hydrogen ion concentration.** Jour. Gen. Physiol. 2: 113-123. *fig. 1-3.* 1919.—The method described for the determination of pepsin depends on the change in conductivity of a digesting egg albumin solution. The author finds that the amount of pepsin removed from the solution by the substrate does not depend on the size of the particles of the substrate. The optimum H-ion concentration for the combination of enzyme and substrate corresponds to the optimum for digestion. The author suggests that the enzyme combines with the ionized protein.—*J. M. Brannon.*

924. Sabatier, Paul. **Ferments and catalyzers.** Sci. Amer. Supplem. 88: 274–275, 278–279. 1919. [Translated from *La Revue Scientifique* (Paris).]

925. Sallinger, Hermann. **Über die angeblichen diastatischen Eigenschaften des Formaldehyds.** [**The alleged diastatic properties of formaldehyde.**] Ber. Deutsch. Chem. Ges. **52B:** 651-656. 1919.—The author thinks he has added proof to the view that starch is indifferent to the action of formaldehyde as an "enzyme."—*G. M. Armstrong.*

926. Shull, C. A. **Physiology of dormancy.** [Rev. of: (1) Crocker, William, and G. T. Harrington. **Catalase and oxidase content of seeds in relation to their dormancy, age, vitality, and respiration.** Jour. Agric. Res. 15: 137-174. *3 fig.* 1918 (See Bot. Absts. 2, Entry 173); (2) Harrington, G. T., and William Crocker. **Resistance of seeds to desiccation.** Jour. Agric. Res. 14: 525-532. 1918 (See Bot Absts. 1, Entry 1394).] Bot. Gaz. **68:** 308–310. 1919.—A review of the data in these papers is introduced by the statement that this study "materially increases our knowledge of the physiology of dormancy and germination of seeds, throws much light on the problems of vitality and respiration, and is a general contribution of much significance to seed physiology.—*H. C. Cowles.*

927. Waksman, Selman A. **A method of testing the amylolytic action of the diastase of Aspergillus oryzae.** Jour. Amer. Chem. Soc. 42: 293–299. 1920.—The method used for obtaining pure starch was that developed by Sherman and associates. The author made a 2 per cent starch paste. This was divided into 10 cc. portions and brought to a temperature of 40°C. The proper amount of enzyme was added after this temperature had been reached. When the starch had all been hydrolyzed, the solution lost its opaque color and became clear. In order to increase the accuracy of determining when hydrolysis was complete the dry starch was allowed to absorb a 0.5 per cent solution of neutral red. This evidently aided in determining when the solution passed from a colloidal to a clear state. The diastase from *Aspergillus oryzae* produces a good deal of glucose. It differs from malt and pancreatic diastase, as these produce chiefly maltose and but little glucose. The author finds that the Lintner method for measuring saccharogenic action of different enzymes upon starch should not be used for comparative studies of different enzymes, since the end-products are not the same in the case of the different enzymes.—*J. M. Brannon.*

928. Wood, Joseph T. **Note on trypsin and a new method of purifying enzymes.** Jour. Soc. Chem. Ind. 37: 313T–315T. 1918.—The author prepared a very pure enzyme solution by soaking Swedish filter paper in the impure trypsin solution, then drying quickly in a current of hot air. When such paper is soaked in water for 15 to 20 minutes, the enzyme is dis-

solved, but proteins are left behind. The pure solution gives no precipitate with safranin, contrary to the usual result with impure preparations. A polariscopic examination of the relatively pure solution shows no rotation. The solution thus obtained is $2\frac{1}{4}$ times as strong as Grübler's trypsin. There is removed by the purification method mentioned about 35 per cent of extraneous matter.—*G. M. Armstrong.*

METABOLISM (RESPIRATION)

929. Bertrand, Gabriel. **Sur le mécanisme de la conservation des fruits dans l'eau froide. [The mechanism of the preservation of fruits in cold water.]** Compt. Rend. Acad. Sci. Paris **168**: 1285–1288. 1919.—The author has previously described (Compt. Rend. **168**: 1162) a method for preserving fruits for comparatively long periods in cold water. Later studies show that a considerable pressure is generated in sealed flasks containing fruit. It has been shown by Regnard that pressure may result in the death of minute animal forms. However, it has been shown that yeasts, etc., resisted greater pressures than were generated in the experiments performed. Cherries were preserved for eleven months under conditions where no pressure developed. It was found that the fruits absorb water and that salts, acids, sugars, and enzymes diffuse outward. Acidity incompatible with the growth of most bacteria was developed and numerous enzymatic changes resulted in the softening and transformation of the fruit. The author considers the most important factor in preservation is the exclusion of oxygen and the maintenance of a rigorous anaerobic condition such that even yeasts are unable to develop. Tests with guaiacum revealed an action similar to that of laccase. From the observations made, the author concludes that the chances of preserving fruit by this method depend: 1st, on the number and vitality of the organisms brought with the fruit; and 2nd, on the development of acidity and the initiation of biochemical processes resulting in the disappearance of O_2. Cut fruits were found to have poor keeping qualities due to their inability to resist the entrance of organisms.—*V. H. Young.*

930. Brooks, Matilda M. **Comparative studies on respiration. 8. The respiration of Bacillus subtilis in relation to antagonism.** Jour. Gen. Physiol. **2**: 5–15. 1919.—Suspensions of *Bacillus subtilis* in 0.75 per cent dextrose were subjected to various salt solutions and the rate of respiration, as indicated by the evolution of CO_2, was determined. NaCl and KCl, at concentrations of 0.15 M and 0.2 M respectively, increase the rate of respiration. At higher concentrations the rate is decreased, $CaCl_2$ increases the rate of respiration at a concentration of 0.05 M and decreases the rate at somewhat higher concentrations. A marked antagonism was observed between NaCl and $CaCl_2$ and between KCl and $CaCl_2$ in their effects on respiration. Antagonism between NaCl and KCl is slight and the antagonism curve shows two maxima.—*Otis F. Curtis.*

931. Gustafson, F. G. **Comparative studies on respiration. 9. The effects of antagonistic salts on the respiration of Aspergillus niger.** Jour. Gen. Physiol. **2**: 17–24. 1919.—Low concentrations of NaCl (0.125, 0.25, 0.5) and $CaCl_2$ (0.5 M) caused an increase in respiration of *Aspergillus niger* in the presence of 0.05 per cent dextrose as measured by the evolution of CO_2. Stronger concentrations of these salts (2 M NaCl and 1.25 M $CaCl_2$) decreased the respiration, probably through their osmotic effect in decreasing the water content of the mycelium. A mixture of 19 cc. of NaCl and 1 cc. of $CaCl_2$ (both 0.5 M) showed an antagonism, in that the respiration was normal, whereas each salt alone caused an increase. The effect of a substance on growth may differ from its effect on respiration, for, in the presence of 0.05 per cent dextrose, 0.5 M NaCl inhibited spore germination of *Aspergillus niger*, while 0.5 M $CaCl_2$ and various mixtures of the two salts did not inhibit spore germination.—*Otis F. Curtis.*

932. Osterhout, W. J. V. **Comparative studies on respiration. 7. Respiration and antagonism. Introductory note.** Jour. Gen. Physiol. **2**: 1–3. 1919.—The author briefly reviews the literature dealing with the effect of antagonistic salts on respiration and states that he has found pronounced antagonism between NaCl and $CaCl_2$ in their effects on this process. —*Otis F. Curtis.*

ORGANISM AS A WHOLE

933. Child, C. M. **A study of susceptibility in some Puget Sound algae.** Publ. Puget Sound Biol. Sta. 2: 249–267. 1919.—About 19 algae were used in the experimental work. These were tested from the standpoint of axial susceptibility, in respect to a few toxic agents. In all these the most actively growing regions were the most susceptibile to the poisons used. While differences in the permeability of the outer portions of cells may account for differences in susceptibility to certain poisons, they cannot account for all, since neutral red and certain other vital dyes probably kill from within the cell.—In *Ptilota pectinata* the differences in susceptibility of the different apical regions and axes enable one to picture the relative physiological conditions in the different parts, and make it possible to interpret to some extent the growth form in physiological terms. Apparently the inhibiting influence of a more actively growing tip is effective through a greater distance in the plant, than that of a less active tip. This is shown by the presence of alternate branching in the more active tips, and opposite branching in the less active ones. Thus activity and branch arrangement are correlated.—Experiments with a species of filamentous diatom, whose filaments are composed of bundle of gelatinous tubes in which are growing a Navicula type of diatom, show that this a pseudothallus is also most susceptible at the tips. Therefore either physiological correlation must exist between the tips and the other parts as in ordinary plants; or else growth and division are gradually inhibited by the gelatinous envelope, so that the individual diatoms at the tips of the pseudothallus are most active because they are in the most favorable situations. The pseudothallus reacts like a plant rather than like a colony.—*T. C. Frye.*

934. Gail, Floyd W. **Hydrogen ion concentration and other factors affecting the distribution of Fucus.** Publ. Puget Sound Biol. Sta. 2: 287–306. 1919.—The hydrogen ion concentration of the sea water is an important factor in distribution. The most favorable P_H is 8.0–8.2. At P_H 8.8 all growth ceases except the germination of oospores. Likewise in seawater of P_H 6.6 (and lower exponents) growth is insignificant or wanting, except in young plants, especially in temperatures above 17°C. Temperature is therefore another determining factor. Of the ranges tried, the lowest, 10.5° to 13°C. was the most favorable. When the temperature was permitted to rise to 30°C. for a part of the time, the growth was almost or wholly stopped. In the presence of much *Ulva* the P_H of the surrounding water is raised too high for *Fucus*. In tide pools the extremes of both temperature and P_H are too great. Both desiccation and light are also important factors.—*T. C. Frye.*

935. Garner, W. W., and H. A. Allard. **Effect of the relative length of day and night and other factors of the environment on growth and reproduction in plants.** Jour. Agric. Res. 18: 553–605. *Pl. 64–79. 35 fig.* 1920.—See Bot. Absts. 5, Entry 22.

936. Harris, J. E. G. **Contributions to the biochemistry of pathogenic anaerobes. VIII. The biochemical comparison of micro-organisms by quantitative methods.** Jour. Path. and Bact. 23: 30–49. *Fig. 1–2.* 1919.—A comparison was made from strictly quantitative data, (1) of the proteolytic and sugar-splitting properties of two anaerobes, *Bacillus sporogenes* and the Reading bacillus, and (2) the oxygen concentrations which permit or inhibit growth of these organisms. The two organisms are morphologically, and in cultural reactions, closely related.—Experimental methods are described for carrying out a comparison of the reactions of these organisms. Details are given of the apparatus used for fermentation experiments and of the methods for obtaining values for gas production, ammonia and amino-acid formation, production of volatile acids, and changes in hydrogen ion concentration and sugar content.—A simple method is described for determining the degree of oxygen toleration of organisms for routine purposes. It is suggested that results should be expressed in the form of the "aerobic index," which is defined.—The results are given in terms of fermentations of 5 different media and of determinations of the aerobic indices both of spores and young organisms on liquid and solid media.—From the results it is concluded that these two organisms are of the same race, but show small differences possibly acquired. In their biochemical behaviour

towards the five media used they are remarkably similar, but they show a somewhat striking difference in their powers of growing in the presence of oxygen.—The use of methods, such as those described, for investigations of the biochemical properties of bacteria in general is discussed, and a means is suggested for using these methods with aerobic organisms.—*W. W. Bonns.*

937. Hawkins, Lon A., and Rodney B. Harvey. **Physiological study of the parasitism of Pythium debaryanum Hesse on the potato tuber.** Jour. Agric. Res. 18: 275–297. *Pl. 35–37.* 1919.—See Bot. Absts. 4, Entry 1298.

938. Rosenheim, O. **Biochemical changes due to environment.** Biochem. Jour. 12: 283–289. 1918.—Only one-fourth the amount of chromogenic substance, probably flavone, was produced in the inflorescence of "Edelweiss" in London as in the native Alps. The difference is attributed to biochemical adaptation, possibly placing the flavones in a protective rôle against ultraviolet light.—*W. H. Chambers.*

939. Tevis, May. **Symbiotes or benevolent microbes and vitamines.** Sci. Amer. Supplem. 88: 282–283. 1919.—This paper is in the main a review of the theories and experiments of M. Paul Portier. According to these views, there are no simple organisms except bacteria, all higher organisms being in reality twofold—the organism itself and the microörganisms distributed throughout its tissues. The mitochondria, a definite number of which exist in each cell, are believed to be symbiotes, that is, polymorphic forms of bacteria. The cell apparently limits the number of symbiotes.—It is held that certain wasting diseases, such as scurvy, beri-beri, etc., are not due to the lack of vitamines, but are caused rather by a deficiency of symbiotes.—*Chas. H. Otis.*

GROWTH, DEVELOPMENT, REPRODUCTION

940. Anonymous. **Vertikales Wachstum der Bäume.** [Rev. of: Cambage, R. H. **The vertical growth of trees.** Jour. and Proc. Roy. Soc. New South Wales 52: 377–384. 1919. See Bot. Absts. 5, Entry 943.)] Naturwissenschaften 7: 354. 1919.

941. Buchanan, R. E. **Life phases in a bacterial culture.** Jour. Infect. Diseases 23: 109–125. 1918.—The growth of a culture of bacteria from initiation until death is divided into 7 phases, and mathematical formulae are presented to express the relation of the growth curve to time for each phase.—*W. H. Chambers.*

942. Budington, R. A. **Influence of certain ductless gland substances on the growth of plant tissues.** Biol. Bull. [Woods Hole] 37: 188–193. *Fig. 1.* 1919.—The growth of root-tips of *Allium* is retarded by the presence in their fluid nutrient environment of thyroid gland material, retradation being approximately proportional to the amount of thyroid substance present. The growth of the early leaves is not modified. Iodine, used as KI, in amounts equivalent to that in thyroid substances provoking marked modifications of growth, had no appreciable effect on growing root-tips. Pituitary substances up to two grains of the desiccated gland, and supra-renal substances up to one grain of the desiccated gland, in 120 cc. of nutritive solution had no effect on the growing root-tips. The experiments, which were limited to a single form, indicate that thyroid constituents may influence the rôle of protoplasmic action in cells other than those of animal tissues.—*J. E. Weaver.*

943. Cambage, R. H. **The vertical growth of trees.** Jour. and Proc. Roy. Soc. New South Wales 52: 377–384. 1919.—Vertical growth in the trees studied is practically limited to the terminal shoot, and it is very probable that when once definite branches are developed the portion of the axis below these increases in diameter but not in length.—*B. M. Duggar.*

944. Hibbard, R. P. **The condition of fruitfulness.** [Rev. of: Kraus, E. J., and H. R. Kraybill. **Vegetation and reproduction with special reference to the tomato.** Oregon Agric. Exp. Sta. Bull. 149. *90 p., 22 fig.* 1918.] Plant World 22: 23–24. 1919.

945. Stålfelt, M. G. **Über die Schwankungen in der Zellteilungsfrequens bei den Wurzeln von Pisum sativum.** [Variations in the frequency of cell division in the roots of Pisum sativum.] Svensk. Bot. Tidskr. [Stockholm] 13: 61–70. 1919.—In experiments on the action of weak electric currents on roots of *Pisum sativum* the author observed a periodicity in cell divisions. The number of dividing cells was counted in 10 sections from each root. Since nuclear division is sensitive to external conditions these experiments were carried out in darkness at a constant temperature. The frequency of cell division in each root is periodic. The intensity of division shows distinct maxima and minima. The rhythm is independent of daily periodicity and therefore not synchronous in different roots. Periods of active division are succeeded by rest periods. The duration time of the phases of cell division is estimated in percentages of the total time required for division as follows: prophase, 32.78 per cent, metaphase, 36.96 per cent, anaphase 19.39 per cent, telophase, 10.95 per cent.—Pea roots of the same age and length were placed in a spiral of fine silver wire which carried 3 milliamperes at low potential. Roots were left in spirals 1 to 10 hours and examined for frequency of cell division. Roots so treated showed the maximum number of dividing cells. The maximum rate of division continues for several hours after stimulation. The author believes that the passage of the current acts as a stimulus which breaks the autonomous period of cell division. —*R. B. Harvey.*

946. Stout, A. B. **Intersexes in Plantago lanceolata.** Bot. Gaz. 68: 109–133. *2 pl.* 1919.—See Bot. Absts. 3, Entry 1517.

MOVEMENTS OF GROWTH AND TURGOR CHANGES

947. Cocks, E. **Making a plant tie itself into a knot.** Sci. Amer. 121: 579. *1 fig.* 1919. —A geotropic response.—*Chas. H. Otis.*

GERMINATION, RENEWAL OF ACTIVITY

948. Andronescu, Demetrius Ion. **Germination and further development of the embryo of Zea Mays separated from the endosperm.** Amer. Jour. Bot. 6: 443–452. *1 pl.* 1919.—Embryos of corn (with their scutella) were separated from their endosperms and germinated in water and in various culture media, of which 1 and 2 per cent sucrose solutions produced the best results. The young plants thus obtained were considerably smaller than those produced by whole kernels, but were otherwise identical with them. When the scutellum as well as the endosperm was removed, growth was very much reduced and the seedlings were unable to develop far.—Seedlings grown from embryos only and those grown from whole kernels were transplanted into soil and the plants obtained were essentially similar, except that the former were somewhat smaller than the latter. The author concludes that in germination and development the presence of endosperm is not essential, but is beneficial.—*E. W. Sinnott.*

949. Anthony, Stephen, and Harry V. Harlan. **Germination of barley pollen.** Jour. Agric. Res. 18: 525–536. *Pl. 60–61.* 1920.—The pollen of barley (*Hordeum*) germinates readily within a period of 5 minutes when proper moisture and temperature conditions are afforded. The moisture relation is extremely critical. In the experiments, moisture was supplied from a fragment of green leaf tissue placed in a dry mount of pollen in a Van Tieghem cell. Slight drying of pollen causes collapse of the cell wall and free moisture causes rapid swelling and bursting.—In field experiments the receptivity of the stigma was found to extend over several days. Pollen used in 8 successive stages of development (from immature to that obtained 2 days after dehiscence of the anther) gave satisfactory percentages of fertilization only when taken from anthers that were dehiscing or had only very recently opened.—No satisfactory means was found of storing barley pollen. A "study of the conditions governing fertilization in nature shows that conditions unfavorable to fertilizations are also unfavorable to progress in the development of pollen and vice versa. In this way natural fertilization is secured."—*D. Reddick.*

950. Kondo, M. **Ueber Nachreife und Keimung verschieden reifer Reiskörner (Oryza sativa).** [After-ripening and germination of rice seeds in various stages of maturity.] Ber. Ohara Inst. Landwirtsch. Forsch. 1: 361–387. 1918.—See Bot. Absts. 3, Entry 2805; 5, Entry 36.

951. Russell, E. J. **Report on the proposed electrolytic treatment of seeds (Wolfryn process) before sowing.** Jour. Ministry Agric. Great Britain 26: 971–981. 1920.—See Bot. Absts. 5, Entry 59.

952. Skårman, J. A. O. **Ett bidrag till frågan om temperaturens betydelse för frönas groning hos Geranium bohemicum L.** [A report on the question of the importance of temperature for the growth of seed of Geranium bohemicum.] Svensk. Bot. Tidskr. [Stockholm) 13: 93–97. 1919.—The author has observed that seeds of *Geranium bohemicum* are capable of withstanding very high temperatures and of remaining viable for many years. They also seem to require special conditions including exposure to considerable heat to bring about germination, as shown by their occurrence only on burned over land.—*W. W. Gilbert.*

953. Störmer. **Keimungshemmungen bei blauen Lupinen.** [A case of arrested germination in blue lupines.] Illustrierte Landw. Zeitg. 39: 12. 1919.—See Bot. Absts. 5, Entry 63.

RADIANT ENERGY RELATIONS

954. Daniel, Lucien. **Recherches sur le développement comparé de la laitue au soleil et a l'ombre.** [Development of lettuce in sun and shade.] Compt. Rend. Acad. Sci. Paris 168: 694–696. 1919.—The author reports the effect of shade on the development of lettuce plants and discusses in a general way the relation of illumination to the duration of species, giantism, and dimorphism.—*F. B. Wann.*

955. Schanz, F. **Effect of light on living organism.** Sci. Amer. Supplem. 88: 179. 1919. [Translated from *Meteorolog. Zeitschr.* (Braunschweig).]

956. Tsuji, T. **The action of ultra-violet rays on sugar-cane, pineapple and banana in Hawaii.** Sci. Amer. Supplem. 87: 327. 1919. [From *Louisiana Planter and Sugar Manufacturer.*]—Investigations on the connection between the action of ultra-violet rays and the formation of carbohydrates, acids, and other compounds.—*Chas. H. Otis.*

TEMPERATURE RELATIONS

957. Edson, H. A., and M. Shapovalov. **Temperature relations of certain potato-rot and wilt-producing fungi.** Jour. Agric. Res. 18: 511–524. *9 fig.* 1920.—See Bot. Absts. 5, Entry 740.

958. Potter, George F. **An apparatus for automatically changing the temperature of a chamber.** Amer. Jour. Bot. 7: 39–43. *3 pl.* 1920.—In order to obtain a uniform and known rate of temperature fall for experiments dealing with the injury of plant tissues by low temperatures, the author has devised a cooling chamber in which the rate of temperature change is automatically controlled by clockwork. This apparatus is described in detail.—*E. W. Sinnott.*

959. Shreve, Edith Bellamy. **A thermo-electrical method for the determination of leaf temperature.** Plant World 22: 100–104. *2 fig.* 1919.—A method of determining leaf temperatures without wounding the tissues is described. The apparatus consists of a pair of thermocouples and a portable galvanometer sensitive to 0.1°C., with damping key, arranged compactly on a board supported on a camera tripod. A reading can be made in a fraction of a second.—*Charles A. Shull.*

TOXIC AGENTS

960. Kidd, Franklin. **Laboratory experiments on the sprouting of potatoes in various gas mixtures. (Nitrogen, oxygen and carbon dioxide.)** New Phytol. 18: 248–252. 1919.—The following conclusions are reached: "1. Oxygen is harmful to the potato tuber in concentrations above 5–10 per cent. Oxygen 80 per cent kills in 4 to 5 weeks. Oxygen 5–10 per cent is the optimal concentration for sprouting. 2. The harmful action of oxygen is increased in the presence of carbon dioxide. 3. Carbon dioxide inhibits sprouting in a concentration of 20 per cent. This concentration is at the same time to some extent harmful. 4. Higher concentrations of carbon dioxide cause marked injury and death."—*I. F. Lewis.*

961. Kryz, Ferdinand. **Ueber den Einfluss von Ultramarin auf Pflanzen. [On the effect of ultramarine on plants.]** Zeitschr. Pflanzenkrankh. 29: 161–166. 1919.—Referring to his earlier experiments with soils containing graphite, the author recapitulates his results as follows. Seeds planted in soil containing a considerable amount of graphite are retarded in germination. Plant growth was retarded and arrested, while transpiration in sunflowers grown in graphite was increased. Since graphite is a chemically indifferent substance, the author raises the question as to whether the action of other indifferent substances would be similar in effect. He chooses ultramarine, describing it as a substance nearly indifferent chemically; stable in air, light, and alkalies; insoluble in water; and only slowly decomposed by acids and acid salts.—His observations are: germination of seeds does not occur very readily in soil containing ultramarine; growth is retarded; but there is no disturbance of transpiration; and neither a "poisonous" nor fatal effect is exerted by this substance. Intense spraying of leaves with ultramarine in water suspensions causes wilting and drying.—*H. T. Güssow.*

962. Richter. [Rev. of: Fallada, O. **Zur Rübensamenbeizung mit Schwefelsäure. (Germination of beet seed after corrosion with sulphuric acid.)** Österreich.-Ungar. Zeitschr. Zuckerindust. und Landw. 46: 22–34. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 324–325. 1918.—A table is given showing the results of treatment of 100 beet seeds with sulphuric acid. Unsoaked seeds were treated as follows: with concentrated sulphuric acid; with sulphuric acid of 53°Bé. and for comparison some which were not treated with acid. Soaked (6 hours) seed were also treated as those above. The poorest germination was shown by the unsoaked seed treated with concentrated acid, and the best germination was shown by seed soaked for 6 hours and then treated with acid of 53°Bé. The seed and acid were heated for 20 to 25 minutes with steam and then the acid was allowed to act for two and one half hours. The number of seed germinated after 2, 3, 4, 6, and 14 days was recorded.—*F. M. Schertz.*

963. Richter. [Rev. of: Greisenegger, Ignaz K. **Versuch mit Samenrüben unter Verwendung von Mangansulfat als katalytischen Dünger. (Experiments on seed beets using manganese sulfate as a catalytical manure.]** Österreich.-Ungar. Zeitschr. Zuckerindust. und Landw. 46: 13–21. 1917.] Biedermann's Zentralbl. Agrikulturchem. 47: 320–323. 1918.—Pot experiments in sand and peat were conducted using Knop's nutrient solution for watering. Fifteen pots were used, placed in 3 groups. Group 1 had no manganese, group 2 had a small quantity of manganese (0.1773 grams or 25 kilograms per hectare), and group 3 had 4 times as much manganese as group 2. The yield of seed per pot was as follows: group 1, 56.3 grams; 2, 57.2 grams; 3, 69.8 grams. The stem yield was greatest in group 1 and least in group 2. In regard to the capacity for germination, 100 seed balls of group 1 produced 149 seedlings; 100 of group 2 produced 139 seedlings, and group 3 produced 131 seedlings. The seed of the above 3 groups were then planted in plots and fertilized (manganese lacking). The seed from the above group 1 produced 108.7 grams of sugar per beet; from group 2 the yield was 112.2 grams per beet; and from group 3, 94 grams. The yield per plot respectively was 4.54, 4.55 and 4.03 kgm. The average weight of each beet was respectively 578, 599, and 512 grams. Other data were worked out for the respective groups.—*F. M. Schertz.*

964. Rumbold, Caroline. **The injection of chemicals into chestnut trees.** Amer. Jour. Bot. 7: 1–20. *7 fig.* 1920.—Injection experiments were carried on in 1913 with 156 young Paragon chestnut trees grafted on native stock. Water, twenty-five inorganic substances (including three colloidal metals), twenty-five organic substances (including extracts of normal and of diseased bark), and five stains were injected. Various concentrations were used, and the amount entering the tree was measured in each case. In general, solutions were absorbed more readily than water, organic compounds more readily than inorganic ones and true solutions more readily than colloidal ones. The more concentrated the solution, the more rapidly it was absorbed. The rate of injection was most rapid in June and next in July, May, August, September, October, and April, respectively. The rate was more variable in the spring than in the summer or autumn, and was dependent to a considerable extent upon the rate of transpiration.—Previous literature on plant injection is reviewed at some length.—*E. W. Sinnott.*

965. Rumbold, Caroline. **Effect on chestnuts of substances injected into their trunks.** Amer. Jour. Bot. 7: 45–56. *2 pl.* 1920.—The author has injected a large number of substances into Paragon chestnut trees, as reported previously (see entry next preceding). The present paper describes the course of injected solutions in the tree, their effect on the tissues, and their influence on the parasitic fungus *Endothia parasitica.* Solutions travel usually in last annual ring of wood and were found to pass downward into the roots and upward into the leaves, and in one case even into the fruit. They are confined to a path but little wider than the diameter of the injection hole. The effect on the tree varied with the dilution of the solution and with the season at which injection was made. Certain substances, notably water, the alkali metals, colloidal metals, most organic compounds, certain dyes, and the water extract of normal bark, were without noticeable effect on the tree. A few, particularly weaker dilutions of alkali metals, apparently acted as slight stimulants. A third group, including the heavy metals, water extract of blight canker, and some others, were detrimental, causing the death of part or all of the tree. Particular solutions were often specific in their detrimental effects. Results as to the effect of injected solutions upon the blight fungus were very inconclusive. A little evidence is brought forward, however, which indicates that dilute solutions of lithium salts injected in the spring months may check somewhat the growth of the fungus canker.—*E. W. Sinnott.*

966. Stoklasa, J., in collaboration with J. Šebor, W. Zdobnický, F. Týmich, O. Horák, A. Némec, and J. Cwach. **Influence of aluminum ions on seed germination.** Sci. Amer. Supplem. 87: 318–320. 1919. [Translated from Biochem. Zeitschr. 91: 137–223. *fig. 1-15.* 1918.]

967. Wyeth, J. F. S. **The effect of acids on the growth of Bacillus coli.** Biochem. Jour. 12: 382–401. 1918.—Initial and final H-ion concentrations of *Bacillus coli* under varying conditions are determined, and it is found that the final reaction of the culture solutions depends on the initial H-ion concentration of the media, the buffer effect of the media, and the nature of the acid. There is a critical point in the H-ion concentration beyond which growth is completely inhibited.—*W. H. Chambers.*

ELECTRICITY AND MECHANICAL AGENTS

968. Baines, A. E. **Electrical conditions of the earth and atmosphere.** Sci. Amer. Supplem. 88: 290–291. 1919.—This article deals in part with plant life. The author believes that everything growing in the soil is charged or electrified by the earth,—the roots, stems, and veins being negative terminals, while the parts of the leaves between the veins act as aerolae, taking their charge from the positive air. An ordinary electrical current passes from air to earth and back again to air through the plant. If the soil is not moist to the root-depth, or if it does not contain electrolytes other than water, the plant is deprived of its supply of current and must suffer injury. It is claimed that if about 1 per cent of ferro sulphate

or other suitable electrolyte is mixed with the soil, or the ground is well watered with the mineral in solution, much of the water ordinarily required by plant life may be dispensed with. Potted plants so treated were kept alive in a warm greenhouse, exposed to the sun's rays, for three months without water. When vegetable life is said to be "resting" during the late autumn and winter months, it is probably due to lowered electrification.—*Chas. H. Otis.*

PHYSIOLOGY OF DISEASES

969. Anonymous. **Disease resistance in plants.** Gard. Chron. 65: 192. 1919.—This editorial is a popular consideration of the phenomenon of resistance in varieties of plants, suggesting briefly an explanation based on the presence and absence of certain chemical factors. The author suggests that the present status of the mechanism of immunity in animals may be a source of encouragement to plant pathologists.—*C. R. Hursh.*

970. Paine, Sydney G., and H. Stansfield. **Studies in Bacteriosis. III.—A bacterial leaf-spot disease of Protea cynaroides, exhibiting a host reaction of possibly bacteriolytic nature.** Ann. Appl. Biol. 6: 27–29. *Pl. 2, fig. 3–6.* 1919.—See Bot. Absts. 5, Entry 757.

971. Rose, D. H. **Infection as related to humidity and temperature.** [Rev. of: Lauritzen, J. T. **The relation of temperature and humidity to infection by certain fungi.** Phytopath. 9: 1–35. 1919.] Bot. Gaz. 68: 66–67. 1919.

MISCELLANEOUS

972. Anders, J. N. **Growing plants as health-giving agents.** Sci. Monthly 10: 63–69. 1920.—This is a popular presentation of the subject.—*L. Pace.*

973. Bobilioff, W. **De inwendige bouw der schorselementen ven Hevea brasiliensis. [The structure of cell elements in the bark of Hevea brasiliensis.]** Arch. Rubbercult. Nederlandsch-Indië 3: 222–231. 1919.—See Bot. Absts. 5, Entry 546.

974. Gagnespain, F. **Vegetable "plethora."** Sci. Amer. Supplem. 88: 220, 232. *1 fig.* 1919. [Translated from *La Rousse Mensuel* (Paris), April, 1919.]—Results of "over-feeding" of plants and differences in habitat between individuals of the same species.—*Chas. H. Otis.*

975. Glover, G. H., T. E. Newson, and W. W. Robbins. **A new poisonous plant, the whorled milkweed Asclepias verticillata.** Colorado Agric. Exp. Sta. Bull. 246. *16 p. 13 fig.* 1918.—Serious losses of stock particularly sheep, are reported from southwestern Colorado due to *Asclepias verticillata.* The plant appears to be poisonous at all stages of growth and when dry. The symptoms of the affected animals are described. Death may result within 8 hours. The poisonous compound was not identified.—*C. R. Hursh.*

976. Harvey, R. B. **A thermo regulator with the characteristics of the Beckman thermometer.** Jour. Biol. Chem. 41: 9–10. *Pl. 1.* 1920.

977. Hibbard, R. P. **Preparation of seed potatoes.** [Rev. of: Appleman, C. O. **Physiological basis for the preparation of potatoes for seed.** Maryland Agric. Exp. Sta. Bull. 212: 79–102. *Fig. 1–11.* 1918.] Plant World 22: 91–92. 1919.

978. Nagel. **Kartoffellagerungsversuche. [Potato storage experiments.]** Illustrierte Landw. Zeitg. 39: 6. 1919.—See Bot. Absts. 5, Entry 46.

979. Weimer, J. L. **Some observations on the spore discharge of Pleurage curvicolla (Wint) Kuntze.** Amer. Jour. Bot. 7: 75–77. 1920.—See Bot. Absts. 5, Entry 695.

SOIL SCIENCE

J. J. Skinner, *Editor*

F. M. Schertz, *Assistant Editor*

GENERAL

980. Anonymous. **The value of lupins in the cultivation of poor, light land.** Sci. Amer. Supplem. 88: 265. 1919. [Abstract of paper read before Agricultural Section, British Assoc. Adv. Sci., by A. W. Oldershaw. (See Bot. Absts. 5, Entry 47.)] Reprinted in Sci. Amer. Supplem. 88: 321. 1919.

981. Bear, Firman E., and J. R. Royston. **Nitrogen losses in urine.** Jour. Amer. Soc. Agron. 2: 319–326. 1919.—The paper gives the results of losses of nitrogen from urine which has been stored under various conditions. Urine exposed to the air lost over 92 per cent of its nitrogen during 8 weeks when the average temperature was 38°C. When urine was not exposed to the air practically no losses took place. Litter allowed to dry out and remain dry lost 20 per cent of its nitrogen content while litter which was kept moist by daily additions of water lost over 97 per cent of its nitrogen. Samples protected with kerosene lost approximately 6 per cent of their nitrogen in 8 weeks.—*F. M. Schertz.*

982. Clevenger, Clinton B. **Hydrogen-ion concentration of plant juices. I. The accurate determination of the hydrogen-ion concentration of plant juices by means of the hydrogen electrode.** Soil Sci. 8: 217–226. 1919.—See Bot. Absts. 5, Entry 876.

983. Clevenger, Clinton B. **Hydrogen-ion concentration of plant juices. II. Factors affecting the acidity of hydrogen-ion concentration of plant juices.** Soil Sci. 8: 227–242. 1919. —See Bot. Absts. 5, Entry 877.

984. Conner, S. D. **The effect of zinc in soil tests with zinc and galvanized iron pots.** Jour. Amer. Soc. Agron. 12: 61–64. 1920.—The author found that acid soils when placed in zinc or galvanized pots, unless limed sufficiently, acted upon the zinc of the pots which were insufficiently protected by the granulated paraffine coating. The water-soluble Zn salts which were found in the soil caused the crops to fail the second season. The action of acid soils on Zn is evidence that soils contain true acids. No good protective coating for the pots was found.—*F. M. Schertz.*

985. Frear, William, and C. L. Goodling. **I. Cost of burning lime in the stack or heap. II. Supplementary report upon the limestone resources of Pennsylvania.** Pennsylvania Agric. Exp. Sta. Bull. 157. *23 p., 4 fig.* April, 1919.

986. Hepner, Frank E. **Wyoming forage plants and their chemical composition.** Wyoming Agric. Exp. Sta. Rept. 28: 117–128. 1917–18.—See Bot. Absts. 5, Entry 26.

987. Hoagland, D. R. **Relation of nutrient solution to composition and reaction of cell sap of barley.** Bot. Gaz. 68: 297–304. 1919.—See Bot. Absts. 5, Entry 859.

988. Kelley, W. P., and E. E. Thomas. **The effects of alkali on citrus trees.** California Agric. Exp. Sta. Bull. 318: 305–337. 1920.

989. Martin, J. C., and A. W. Christie. **Effect of variation in moisture content on the water-extractable matter of soils.** Jour. Agric. Res. 18: 139–143. 1919.—The water-soluble constituents of two soils of very different types have been studied at four moisture contents. The moisture contents approaching the air dry condition show a decided tendency to depress the nitrates and potash in both soils and the sulfates in the silty clay loam only. These depressions are reflected in the total dissolved material. The excess water in the sandy loam

soil causes a disappearance of nitrates and also decidedly depresses the potassium, calcium and magnesium, these losses also being reflected in the total solids extracted. Considerable variations in moisture contents of soils, provided the saturation point is not reached, do not appreciably modify the results obtained by the water-extraction method.—*F. M. Schertz.*

990. Russell, E. J. **Soil making.** Jour. Roy. Hortic. Soc. 44: 1-12. 1919.—This is a popular discussion of soils, soil changes and soil management, based largely on experiments at Rothamsted.—*J. K. Shaw.*

991. Shedd, O. M. **Effect of oxidation of sulphur in soils on the solubility of rock phosphate and on nitrification.** Jour. Agric. Res. 18: 329–345. 1919.—Compost experiments of rock phosphate, sulfur, soil and manure show after 24 months time, that about 17 and 84 per cent of the total phosphorus had been converted into a water-soluble and ammonium-citrate-soluble form, respectively. Sulphofication did not proceed as rapidly as when an inoculation was made with the sulphofying organism, and when this was done the time of the sulphofication may be considered to be reduced nearly one third. Composting under the same conditions but omitting the sulfur also showed favorable results in rendering the soil phosphate or that added in rock sulphate soluble, but not to the same extent as when sulphur was present. Nitrification was found to proceed to a certain extent regardless of the acid formed by the sulphur oxidation. The amounts of nitrogen found to be nitrified amounted to approximately 20 per cent of the total originally present. Sulphofication was found to take place in all of the soils examined but varied somewhat according to the type. When 25 and 50 mgm. of sulphur were added to 100 grams of soil, about the same percentage of the total was oxidized in a given time. Inoculation of mixtures of rock phosphate and sulphur was not sufficient to promote rapid sulphofication. It required in addition, soil or soil water. That the production of soluble phosphate was caused by the presence of sulphuric acid generated by the oxidation of the sulphur is demonstrated by the parallel rise in acidity and sulphate. The best conditions to promote the reaction are initial inoculation, high temperature, thorough aeration, and a fair moisture content. Other contributing factors are the proportions of the different ingredients and probably their mass. The acid phosphate made by this procedure has just as good a physical condition as the commercial product and would be cheaper if the time and labor involved in its manufacture are disregarded.—*F. M. Schertz.*

992. Shull, C. A. **Soil fertility.** [Rev. of: Van Alstine, E. **The movement of plant food within the soil.** Soil Sci. 6: 281–308. 1918. (See Bot. Absts. 2, Entry 1341.)] Bot. Gaz. 68: 312. 1919.

993. Takahashi, R. **On the fungous flora of the soil.** Ann. Phytopath Soc. Japan 1^2: 17–22. 1919. See Bot. Absts. 5, Entry 688.

994. Watts, Francis. **The liming of soils.** West Indian Bull. 16: 332–341. 1918.—Compiled information.—*C. V. Piper.*

INFLUENCE OF BIOLOGICAL AGENTS

995. Barthel, Chr., and N. Bengtsson. **The influence of lime on the nitrification of barn-yard manure—nitrogen in arable soil.** Soil Sci. 8: 243–258. 1919. Manure or ammonium sulfate was added to limed and unlimed neutral and acid soils. Weekly determinations of the ammonia and nitrates were made. Lime stimulated the nitrification of the ammonium sulfate but exerted no favorable action on the nitrification of stable manure or in cases where the supply of lime was large impeded the nitrification.—*William J. Robbins.*

996. Hills, T. J. **Influence of nitrates on nitrogen assimilating bacteria.** Tropic. Agriculturist 52: 44–45. 1919.—Two lines of investigation, one on the influence of nitrate on azotobacter and the other on the influence of nitrate on B. radicicola in the soil, were briefly summarized without details of procedure. Full report given in Bull. Internat. Inst. of Agric., Sept., 1918.—*R. G. Wiggans.*

997. Jones, D. H., and F. G. Murdock. **Quantitative and qualitative bacterial analysis of soil samples taken in fall of 1918.** Soil Sci. 8: 259–267. 1919.—A surface and sub-surface sample of 46 soils representing 17 soil types in eastern Ontario were examined for total bacterial and mold counts on Brown's albumen agar, liquefier counts on a nutrient gelatine and Azotobacter, Ps. radicicola and Nocardia counts on a modified Ashby's agar. Only 3 samples had a very low total count. Azotobacter were found in 9 out of the 17 soil types and were absent in the light sandy soils and peat muck and shale types. Every soil type except yellow sand had fairly high numbers of Ps. radicicola and the sub-surface samples had a higher content than the surface samples. Molds were fairly uniform in numbers in all soils except a sandy clay loam and sandy clay shale in which they were absent. Nocardia were least numerous in sand but much alike in numbers in loams, peat mucks and shales.—*William J. Robbins.*

998. Waksman, Selman A. **Cultural studies of species of Actinomyces.** Soil Sci. 8: 71–215. *4 pl.* 1919.—The morphology, cultural characteristics and biochemical features of 41 species of Actinomyces are described and compared. A note is given on the habitat of each species. The cultural characteristics for each species include those on 13 or 14 different solid and liquid media. The utilization of different carbon or nitrogen compounds is also included in some cases. The biochemical features include nitrite formation, proteolytic action, change of reaction, inversion of sugar, diastatic action and growth on cellulose. Nearly all the Actinomyces studied reduce nitrates to nitrites and show diastatic and proteolytic activities. Most of the species studied grow on cellulose and half of them invert sugar. A key for the identification of the species based chiefly on biochemical characteristics is presented.—*William J. Robbins.*

FERTILIZATION

999. Calvino, M. **La fertilidad de la tierra y los abonos. III. El estiercol y los otros abonos organicos. [Manure and other organic fertilizers.]** Revist. Agric. Com. y Trab. 2: 540–543. *1 fig.* 1919.—Largely a translation of an article by Gino Beccari of the University of Pisa.—*F. M. Blodgett.*

1000. Calvino, Mario. **La fertilidad de la tierra y los abonos. [The fertility of the soil and fertilizers.]** Revist. Agric. Com. y Trab. 2: 501–503. 1919.

1001. Jones, Joseph. **Manurial experiments with cacao in Dominica.** West Indian Bull. 16: 342–353. 1918.—Reports results of plot experiments with various fertilizers.—*C. V. Piper.*

1002. Sampson, H. C. **Some factors which influence yield of paddy in comparative manurial experiments at the Manganallur Agricultural Station.** Agric. Jour. India 14: 739–746. 1919.—Experimental errors in field experiments are discussed, and the advantages and disadvantages of 1 year and long time fertilizer experiments given. No experimental data is given.—*J. J. Skinner.*

METHODS

1003. Brackett, R. N., and H. F. Haskins. **Report on nitrogen.** Jour. Assoc. Official Agric. Chem. 3: 207–217. 1919.—In the zinc-ferrous sulfate-soda method for nitrates the results of the different workers are too variable. The chief difficulty in the method lies in the distillation with the use of glass wool in the neck of the flask. Further work was recommended in the case of water-insoluble organic nitrogen. The Jones and Street method has been shown to be useful for distinguishing between good and bad organic ammoniates. Some difficulties in the method however are yet to be overcome. Results obtained with the Kjeldahl-Gunning-Arnold method using copper sulfate in lieu of oxide of mercury and with oxide of mercury alone, were very satisfactory, there being a good agreement and practically no difference in the averages. The oxide of mercury seems to be a little more effective and rapid in its cata-

lytic action than copper sulfate and perhaps the digestion in the case of copper should be more prolonged than with mercury. The use of sodium sulfate in the place of potassium sulfate in the Gunning method and its modifications is to be studied.—*F. M. Schertz.*

1004. Fippin, Elmer O. **The truefast test for sour soil.** Jour. Amer. Soc. Agron. 12: 65–68. 1920.—The paper describes the chemical principles employed by the truefast test and points out the special features of the outfit. The manner of using the outfit is given.—*F. M. Schertz.*

1005. Frear, Willham, Walter Thomas, and H. D. Edmiston. **Notes on the use of potassium permanganate in determining nitrogen by the Kjeldahl method.** Jour. Assoc. Official Chem. 3: 220–224. 1919.—Results of the authors show that for the fertilizer mixtures represented the addition of permanganate caused a distinct loss of nitrogen. The loss depended somewhat upon the amount of permanganate but chiefly upon the time of the addition. If the addition was delayed for two minutes after removal from the flame no loss in nitrogen was observed.—*F. M. Schertz.*

1006. Phelps, I. K., and H. W. Daudt. **Investigations of the Kjeldahl method for the determination of nitrogen.** Jour. Assoc. Official Agric. Chem. 3: 218–220. 1919.—The hydrolysis of certain organic compounds of various constitutions was studied. In the presence of 0.7 gram of mercuric oxide, 10 grams of K_2SO_4 and 25 cc. of H_2SO_4, weights of the compound varying from 0.2 to 0.4 gram were hydrolyzed completely by 2.5 hours of boiling.—*F. M. Schertz.*

1007. Trowbridge, P. F. **Symposium on the determination of nitrogen in fertilizers.** Jour. Assoc. Official Agric. Chem. 3: 217–218. 1919.—The paper gives the answers of 38 station chemists and 17 commercial chemists, to a questionnaire on methods of determining nitrogen in fertilizers. Twenty-one chemists use a gram sample. Either mercury oxide or mercury is used by 41. Thirty-two do not use potassium permanganate at the close of the digestion. Sulphuric acid as standard is used by 31 chemists and 28 use sodium hydroxide to titrate the excess of acid. Cochineal is used as indicator by 42 chemists. Others use methyl red, methyl orange, congo red, sodium alizarin sulphonate, alizarin red and lacmoid. NH_4OH was compared with NaOH for titrating and out of 203 samples of fertilizer analyzed at different times 105 samples gave 0.01 per cent higher results with NaOH.—*F. M. Schertz.*

TAXONOMY OF VASCULAR PLANTS

J. M. Greenman, *Editor*

E. B. Payson, *Assistant Editor*

SPERMATOPHYTES

1008. Aellen, Paul. **Neue Bastardkombinationen im Genus Chenopodium. (New Hybrid-combinations in the genus Chenopodium.]** Rep. Sp. Nov. 15: 177–179. 1918. [Rep. Eu. & Med. 1: 257–259.]—The following new hybrid-combinations and new varieties are published: × *Chenopodium leptophylliforme* (*C. album* × *leptophyllum*), × *C. leptophylliforme* Aellen var. *glabrum*, × *C. pseudoleptophyllum* (*C. hircinum* × *leptophyllum*) and × *C. Binzianum* var. *obtusum*, × *C. basileense* [(*C. hircinum* × *striatum*) × *album* = *C. Haywardiae* × *album*].—*E. B. Payson.*

1009. Arthur, J. C. **New names for species of Phanerogams.** Torreya 19: 48–49. 1919. —In listing the hosts of Uredinales for the North American Flora, the author makes the following new combinations: *Senites Hartwegi* (*Zeugites Hartwegi* Fourn.), *Sanguinale pruriens* Trin. (*Panicum pruriens Trin.*), [Corrected (Torreya 19: 83. 1919) to read *Syntherisma*

pruriens (Trin.) Arthur. nom. nov.], *Nymphoides Grayanum* (*Limnanthemum Grayanum* Griseb.), *Aureolaria virginica* (*Rhinanthus virginicus* L.), *Dasystephana spathacea* (*Gentiana spathacea* HBK.), and *D. Menzesii* (*Gentiana Menzesii* Griseb.).—*J. C. Nelson.*

1010. Balfour, Bayley. **Some late-flowering gentians.** Trans. Proc. Bot. Soc. Edinburgh 27: 246–272. 1918.—The author discusses several species of Asiatic gentians belonging to the section *Frigida* Kusnezow. Detailed descriptions of the species with synonymy are given and exsiccatae cited. The species treated are: *Gentiana Farreri* Balf. f., *G. Lawrencei* Burkill, *G. sino-ornata* Balf. f., *G. Veitchiorum* Hemsl., *G. ornata* Wall., and *G. prolata* Balf. f. —*J. M. Greenman.*

1011. Balfour, Bayley. **The genus Nomocharis.** Trans. Proc. Bot. Soc. Edinburgh 27: 273–300. 1918.—This article presents a consideration of the liliaceous genus *Nomocharis* of China and the Himalayas. The genus now embraces some 13 species of which the following are new: *Nomocharis Forrestii, N. saluenensis, N. tricolor,* and *N. Wardii.*—*J. M. Greenman.*

1012. Bitter, Georg. **Solanaceae quattuor austro-americanae adhuc generibus falsis adscriptae. [Four South American Solanaceae hitherto ascribed to the wrong genera.]** Rep. Sp. Nov. 15: 149–155. 1918.—**Solanocharis** is described as a new genus and to it assigned *S. albescens* (*Poecilochroma albescens* Britt.). The following new combinations are also made: *Jochroma Lehmannii* (*Poecilochroma Lehmanni* Damm.), *Vassobia dichotoma* (*Cyphomandra dichotoma* Rusby) and *Solanum Lauterbachii* (*Cyphomandra Lauterbachii* Hub. Winkl.).—*E. B. Payson.*

1013. Black, J. M. **Additions to the flora of South Australia. Nos. 13, 14.** Trans. Proc. Roy. Soc. South Australia 42: 38–61, *pl. 5–8,* 168–184, *pl. 15–18.* Dec. 24, 1918.—Important data are recorded concerning the flora of South Australia and the following plants are described as new: *Melaleuca quadrifaria* F. v. M., *Spyridium eriocephalum* Fenzl. var. *adpressum, Limnanthemum stygium,* and *Dicrastylis verticillata, Stipa scabra* Lindl. var. *auriculata, Muehlenbeckia coccoloboides, Atriplex crassipes, A. campanulatum* Benth. var. *adnatum, Acacia rivalis, Frankenia foliosa, F. muscosa, F. cordata, F. serpyllifolia* Lindl. var. *eremophila,* and *Minuria rigida.*—*J. M. Greenman.*

1014. Bois, D. **Nothopanax Davadii.** Revue Horticole [Paris] 91: 212–213. *Fig. 67–68.* Jan., 1919.—See Bot. Absts. 3, Entry 1526.

1015. Brown, William H., and Arthur F. Fischer. **Philippine bamboos** Bur. Forestry, Dept. Agr. & Nat. Resources. [Manila.] Bull. 15. *32 p. Pl. 1–23.* 1918.—This paper deals primarily with the bamboos as a minor forest product of the Philippine Islands; nevertheless it is of interest to the taxonomist, since the authors include keys to the genera and recognize 30 or more species several of which are described and illustrated.—*J. M. Greenman.*

1016. Cardot, J. **Le cognassier de Delavay. [The quince of Delavay.]** Revue Horticole [Paris] 90: 131–133, *fig. 45–47.* 1918.—*Pirus Delavayi* Franchet (*Docynia Delavayi* Schneider) is transferred to the genus *Cydonia* as *C. Delavayi* Card.—*Adele Lewis Grant.*

1017. Challinor, R. W., Edwin Cheel, and A. R. Penfold. **On a new species of Leptospermum and its essential oil.** Jour. Proc. Roy. Soc. New South Wales 52: 175–180. Sept. 18, 1918.—*Leptospermum flavescens* var. *citratum* Bailey & White is raised to specific rank. Specimens on which this species is based were first collected at Copmanhurst, New South Wales, in 1911.—*J. M. Greenman.*

1018. Correvon, H. **Les Cyclamens sauvages. [The wild cyclamens.]** Revue Horticole [Paris] 90: 180–183, 196–198. 1918.—The author gives the results of several years of experience in growing various wild species of *Cyclamen.* A key by M. R. Buser to the cultivated species of this genus is included in which 24 species are listed.—*Adele Lewis Grant.*

1019. Dammer, U. **Zwei neue Solanaceen, Iochroma (Euiochroma) Weberbaueri und Cacabus multiflorus aus Peru.** [Two new solanaceous plants, Iochroma (Euiochroma) Weberbaueri and Cacabus multiflorus from Peru.] Rep. Sp. Nov. 15: 266–267. 1918.—The following species are described as new to science: *Iochroma Weberbaueri* and *Cacabus multiflorus.*—*E. B. Payson.*

1020. Dammer, U. **Eine neue Liliacee, Triocyrtis parviflora, aus Japan.** [A new Liliaceous plant, Tricyrtis parviflora, from Japan.] Rep. Sp. Nov. 15: 267–268. 1918.—*Tricyrtis parviflora* is described as a species new to science.—*E. B. Payson.*

1021. Dammer, U. **Neue Arten von Lachemilla aus Mittel- und Südamerika.** [New species of Lachemilla from Central and South America.] Rep. Sp. Nov. 15: 362–365. 1918.—The following species from Mexico, Costa Rica and Colombia are described as new to science: *Lachemilla Tonduzii, L. costaricensis, L. Purpusii, L. laxa, L. Uhdeana, L. Moritziana,* and *L. columbiana.*—*E. B. Payson.*

1022. Dinter, K. **Index der aus Deutsch-Südwestafrika bis zum Jahre 1917 bekannt gewordenen Pflanzenarten. II.** [Index to the species of plants known from German Southwest Africa to the year 1917. II.] Rep. Sp. Nov. 15: 340–355. 1918.—This alphabetical list, chiefly of flowering plants, includes a limited citation of synonyms and exsiccatae. The following new specific and varietal names or combinations are included: *Arctotis karasmontana, Asclepias filiformis* Benth. & Hook. var. *Buchenaviana, Atriplex sarcocarpus, Barbacenia minuta* (*Vellozia minuta* Baker), *Caralluma ausana* Dtr. & Brgr., *Cassia obovata* Collad. var. *pallidiflora.*—*E. B. Payson.*

1023. Engler, A. **Hieronymusia Engl., eine neue Gattung der Saxifragaceen.** [Hieronymusia, a new genus of the Saxifragaceae.] Notizblatt Königl. Bot. Gart. Mus. Berlin 7: 265-267. Oct. 1, 1918.—**Hieronymusia** is described and illustrated as a new genus of the Saxifragaceae. The genus is monotypic and is based on *Saxifraga alchemilloides* Griseb. (*Suksdorfia alchemilloides* (Griseb.) Engl.) a native of South America.—*J. M. Greenman.*

1024. Erikson, Johan. **Platanthera bifolia × montana i Blekinge** (one of the southern provinces of Sweden). (In Swedish.) Bot. Notiser 1918: 59–62. 1918.—*P. A. Rydberg.*

1025. Fraser, James. **A new grass, Koeleria advena Stapf.** Trans. Proc. Bot. Soc. Edinburgh 27: 302–303. 1918.—*Koeleria advena* Stapf is described as a new species of grass from specimens collected in the neighborhood of Edinburgh. The new grass appears to have been introduced into Scotland from eastern Spain or northwest Africa.—*J. M. Greenman.*

1026. Gamble, J. S. **Flora of the Presidency of Madras. Part III. Leguminosae-Caesalpinioideae to Caprifoliaceae.** $12\frac{1}{2} \times 18\frac{1}{2}$ cm. *P. 391–577.* Adlard & Son & West Newman: London, 1919.—The present part begins with the subfamily Caesalpinioideae and continues through the Caprifoliaceae to the Rubiaceae in substantial accord with the Bentham and Hooker arrangement of families. The following new names and new combinations are included: *Delonix elata* (*Poinciana elata* L.), *Mimosa Prainiana, Rubus Wightii* (*R. rugosus* Wt., not Sm.), *Photinia Lindleyana* W. & A. var. *tomentosa, Jambosa Mundagam* (*Eugenia Mundagam* Bourd.), *J. Rama-Varma* (*Eugenia Rama-Varma* Bourd.), *J. occidentalis* (*Eugenia occidentalis* Bourd.), *J. Beddomei* (*Eugenia Beddomei* Duthie), *Syzygium Myhendrae* (*Eugenia Myhendrae* Bedd.), *S. Benthamianum* (*Eugenia Benthamiana* Wt.), *S. microphyllum* (*Eugenia microphylla* Bedd.), *S. montanum* (*Eugenia montana* Wt.), *S. Chavaran* (*Eugenia Chavaran* Bourd.), *S. malabaricum* (*Eugenia malabarica* Bedd.), *S. operculatum* (*Eugenia operculata* Roxb.), *S. Stocksii* (*Eugenia Stocksii* Duthie), *S. Jambolanum* DC. var. *axillare, Sonerila versicolor* Wt. var. *axillaris* (*S. axillaris* Wt.), *Trianthema triquetra* Rottl. var. *oblongifolia, Heracleum rigens* Wall. var. *multiradiatum, H. rigens* Wall. var. *elongatum, H. courtallense* (*H. rigens* Wall. var. *Candolleana* C. B. Clarke, in part), *H. Candolleanum* (*H. rigens* Wall. var. *Candolleana* C. B. Clarke, in part), *Schefflera micrantha* (*Heptapleurum rostratum* var.

micrantha C. B. Clarke), *S. Roxburghii* (*Aralia digitata* Roxb.), *S. venulosa* Harms var. *obl quinervia*, and *Alangium salvifolium* var. *hexapetalum* Wang. (*A. hexapetalum* Lamk.).— *J. M. Greenman.*

1027. Harms, H. **Araliaceae andinae.** Rep. Sp. Nov. **15**: 245–254. 1918.—From th Andes of South America are described the following species as new to science or hithert unpublished with a diagnosis: *Schefflera lasiogyne*, *S. Sodiroi*, *Oreopanax gnaphalocephalu O. pariahuancae*, *O. Ruizii* Decne., *O. Sodiroi*, *O. brachystachyus* Decne, *O. brunneus* Decne *O. ischnolobus*, *O. stenodactylus*, *O. Moritzii*, *O. mucronulatus*, *O. malacotrichus*, *O. palam phyllus*, *O. Trianae* Decne., *Aralia? Weberbaueri.*—*E. B. Payson.*

1028. Hassler, E. **Solanacea paraguariensia critica vel minus cognita.** Rep. Sp. Nov **15**: 113–121. 1918.—The first of two articles on solanaceous plants occurring in Paragua gives critical notes on eight species of *Solanum* together with extensive citation of synonym and exsiccatae. The following varieties new to science and new varietal combinations occur *Solanum nudum* HBK. var. *pseudo-indigoferum*, *S. nudum* HBK. var. *micranthum* (*S. micran thum W.*), *S. verbascifolium L.* var. *typicum*, *S. Ipomoea* Sendt. var. *ipomoeoide* (*S. ipomoe oides* Chod. & Hassler), *S. Ipomoea* Sendt. var. *macrostachyum*, *S. malacoxylon* Sendt. var *genuinum*, *S. malacoxylon* Sendt. var. *subvirescens.* Several new forms and subforms are also included.—*E. B. Payson.*

1029. Hassler, E. **Solanacea paraguariensia critica vel minus cognita. II.** Rep. Sp. Nov. **15**: 217–245. 1918.—Critical notes, synonyms and citations of exsiccatae are given of 38 species, principally of the genus *Solanum.* The following new names and combinations in groups of specific and varietal rank as well as varieties new to science are published: *Solanum hirtellum* (*Atropa hirtella* Spreng.), *S. hirtellum* (Spreng.) Hassler var. *diminutum* Bitt., *S. verruculosum* (*Cyphomandra verrucuolsa* Hassler), *S. citrifolium* W. var. *typicum*, *S. citrifolium* W. var. *ochandrum* (*S. ochandrum* Dun.), *S. citrifolium* W. var. *leucodendron* (*S. leucocendron* Sendt.), *S. violifolium* Schott. var. *asarifolium* (*S. asarifolium* Kth. & Bouché), *S. pseudocapsicum* L. var. *typicum*, *S. pseudocapsicum* L. var. *Sendtnerianum*, *S. pseudocapsicum* L. var. *hygrophilum* (*S. hygrophilum* Schlechtd.), *S. pseudocapsicum* L. var. *ambiguum*, *S. torvum* Sw. var. *genuinum*, *S. torvum* Sw. var. *lanuginosum* (forma *lanuginosum* Sendt.), *S. bonariense* L. var. *paraguariense* (*S. paraguariense* Chod.), *S. lycocarpum* St. Hil. var. *genuinum*, *S. lycocarpum* St. Hil. var. *paraguariense*, *S. lycocarpum* St. Hil. var. *macrocarpum* (*S. grandiflorum* var. *macrocarpum* Hassler), *S. Balansae* (*S. Brownii* Chod.), *S. Balansae* Hassler var. *typicum*, *S. Balansae* Hassler var. *lyratifidum*, *S. Balansae* Hassler var. *ambiguum*, *S. Balansae* Hassler var. *genuinum*, *S. Balansae* Hassler var. *aureomicans*, *S. Balansae* Hassler var. *subinerme*, *S. robustum* Wendl. var. *laxepilosum*, *S. robustum* Wendl. var. *concepcionis*, *S. viridipes* Dun. var. *intermedium*, *Lycium chilense* Bert. var. *normale*, *L. chilense* Bert. var. *heterophyllum*, *L. Morongii* Britt. var. *typicum*, *L. Morongii* Britt. var. *indutum*, *Capsicum microcarpum* DC. var. *glabrescens.* Many new subspecies, forms and subforms are included or new combinations in these subspecific groups occur.—*E. B. Payson.*

1030. Herter, W. **Itinera Heteriana I.** Rep. Sp. Nov. **15**: 373–381. 1918.—[Rep. Eu. & Med. 1: 309–317.]—I. *Cruciferae mediterraneae.* The author presents an alphabetical list of *Cruciferae* collected by himself in regions adjacent to the Mediterranean Sea with complete data for each collection. II. *Umbelliflorae mediterraneae.* A list, similar to the above, includes certain members of the families *Araliaceae*, *Umbelliferae* and *Cornaceae.*—*E. B. Payson.*

1031. Javorka, S. **Kisebb megjegyzések és újabb adatok. VI.** [**Minor observations and new data. VI.**] Bot. Közlemények. **17**: 52–60. 1918.—Notes are recorded concerning several flowering plants of Hungary and one new form is characterized, namely *Draba Simonkaiana* Jav. f. *retyezátensis.*—*J. M. Greenman.*

1032. Jørgensen, E. **Ajuga pyramidalis × reptans.** Bergens Museum Aarbok 1917–1918. Naturvidenskabelig raekke 5: 1–4. 1918.—A hybrid between *Ajuga pyramidalis* and *A. reptans* L. is recorded and its important characters contrasted with those of the parent species.—*J. M. Greenman.*

1033. Knuth, R. **Geraniaceae Novae. I.** Rep. Sp. Nov. 15: 135–138. 1918.—The following species native to South Africa are published as new to science: *Pelargonium uniondalense, P. grandicalcaratum, P. rungvense, P. Patersonii, Monsonia stricta, M. alexandraensis,* and *M. Rudatisii.*—*E. B. Payson.*

1034. Koorders, S. H., and Th. Valeton. **Atlas der Baumarten von Java.** [Atlas of the species of trees of Java.] Roy. *8vo.* 1: *Pl. 1–200.* 1913; 2: *Pl. 201–400.* 1914; 3: *Pl. 401–600.* 1915; 4: *Pl. 601–800.* 1918. P. W. M. Trap. Leiden.—This work in four volumes of four numbers each, illustrates nearly 800 species of Javanese trees in detail. Many habit sketches and a few reproductions of photographs showing the general appearance of the trees are given. *Ormosia incerta* Krds. is described as new to science. Aside from this, descriptions are not given, but references are made to works in which descriptions do occur. The present atlas, although a complete work in itself, is intended to supplement previous publications of the same authors, especially the "Bijdragen tot de Kennis der Boomsoorten van Java" [Contributions to the knowledge of the tree species of Java]. [See also Bot. Absts. 4, Entry 1735]. —*E. B. Payson.*

1035. Léveillé, H., and A. Thellung. **Oenothera argentinae spec. nov.** Rep. Sp. Nov. 15: 133–134. 1918.—This species published previously with an insufficient diagnosis is here completely characterized. Its place of origin is perhaps the Argentine.—*E. B. Payson.*

1036. Maiden, J. H. **The tropical acacias of Queensland.** Proc. Roy. Soc. Queensland 30: 18–51. *Pl. 1–7.* 1918.—The author gives an annotated list of 60 recognized species of *Acacia* from Queensland, including the following which are described as new to science: *Acacia Bancrofti, A. curviveria, A. Whitei, A. argentea,* and *A. Armitii* (*A. deliberata* F. v. M., not A. Cunn.).—*J. M. Greenman.*

1037. Mez, Carl. **Sacciolepis, Mesosetum, Thrasya, Ichnanthus genera speciebus novis aucta.** Rep. Sp. Nov. 15: 122–133. 1918.—The following species are described as new to science: *Sacciolepis longissima, S. micrococcus, S. delicatula, S. Karsteniana, Mesosetum penicillatum, M agropyroides, Thrasya trinitensis, Ichnanthus lancifolius, I. Weberbaueri, I. lasiochlamys, I. verticillatus, I. montanus* (*Panicum inconstans* var. *montanum* Trin.), *I. peruvianus, I. trinitensis, I. polycladus, I. drepanophyllus, I. longiglumis, I. venezuelanus* and *I. Gardneri.*—*E. B. Payson.*

1038. Mottet, S. **Noveaux Trollius.** [New Trollius.] Revue Horticole [Paris] 90: 102–103. *1 pl.* 1918.—Two plants of this genus are described and illustrated. The first, *Trollius Ledebourii* Rchb. comes from Siberia while the second, *T. pumilus* var. *yunnanensis* Hort. is described as new and was grown from seed sent from Yunnan, China.—*Adele Lewis Grant.*

1039. Mottet, S. **Un Nouveau Columnea Hybride.** [A new Columnea hybrid.] Revue Horticole [Paris] 90: 168–170. *1 pl. and 1 text fig.* 1918.—The author describes and illustrates a new hybrid, *C. vedrariensis* Hort., resulting from a cross between *C. Schiedeana* Schlecht. and *C. magnifica* Oersted.—*Adele Lewis Grant.*

1040. Mottet, S. **Neillia, Physocarpus et Stephanandra.** Revue Horticole [Paris] 91: 236–238. *Fig.* 77. Feb., 1919.—See Bot. Absts. 3, Entry 1544.

1041. Mottet, S. **Nouveaux Viburnum de la Chine.** [New Viburnum of China.] Revue Horticole [Paris] 91: 262–264. *1 pl. (colored).* Apr., 1919.—See Bot. Absts. 3, Entry 1548.

1042. Porto, P. Campos. **O Cambuci (Paivaea Landsdorffii Berg.).** 21 × 27½ cm. *14 p. 9 fig.* Estabelecimento Graphico de Steele & C. Rio de Janeiro, 1920.—This pamphlet, published by the Botanical Garden in Rio de Janeiro, illustrates and gives a detailed account of *Paivaea Langsdorffii* Berg. with particular reference to its edible fruit.—*J. M. Greenman.*

1043. Pritzel, E. **Basedowia, eine neue Gattung der Compositen aus Zentral-Australien [Basedowia, a new genus of the Compositae from central Australia.]** Ber. Deutsch. Bot. Gesellsch. **36**: 332–337. *Pl. 12.* Oct. 18, 1918.—*Basedowia helichrysoides* is described and illustrated as a new genus and species of the Compositae. It is placed under the *Helichryseae* and is related to *Cassinia* and to *Helichrysum.*—*J. M. Greenman.*

1044. Pritzel, E. **Species novae ex Australia centrali.** Rep. Sp. Nov. **15**: 356–361. 1918.—The following species and varieties new to science are characterized: *Triodia Basedowii*, *Crotalaria Strehlowii*, *Indigofera Basedowii*, *I. leucotricha*, *Swainsona phacoides* Benth. var. *erecta*, *Petalostyles spinescens*, *Heterodendron floribundum*, *Eremophila castelli Arminii*, *E. Leonhardiana*, *E. Strehlowii*, *Canthium lineare*, *Olearia arida*, *Rutidosis panniculata.*—*E. B. Payson.*

1045. Rogers, R. S. **Notes on Australian orchids, together with a description of some new species.** Trans. & Proc. Roy. Soc. South Australia **42**: 24–37. *Pl. 2–4.* Dec. 24, 1918.—The author presents a synopsis with critical notes of several genera of orchids. The following species are new to science: *Calochilus cupreus*, *Pterostylis pusilla*, and *Prasophyllum regium.*—*J. M. Greenman.*

1046. Rubner, K. **Ein neues Epilobium (E. Graebneri) aus Westrussland. [A new Epilobium (E. Graebneri) from western Russia.]** Rep. Sp. Nov. **15**: 179–180. 1918. [Rep. Eu. & Med. **1**: 259–260.]—*Epilobium Graebneri* is characterized as a species new to science.—*E. B. Payson.*

1047. Schlechter, R. **Die Gattung Aganisia Ldl. und ihre Verwandten. [The genus Aganisia Ldl. and its relatives.]** Orchis **12**: 24–42. *Pl. 2–5.* 1918.—The present article, which is continued from a previous number of this magazine (**12**: 6–16, *pl. 1.* 1917), includes a synoptical revision of *Koellensteinia* Rchb. f., *Paradisianthus* Rchb. f., *Warreella* Schltr., and **Otostylis** Schltr. n. gen. The following new species and new names are recorded: *Koellensteinia peruviana* from Peru, *K. eburnea* (*Cyrtopodium eburneum* Barb. Rodr. from Brazil, *K. Roraimae* from Guiana, *K. boliviensis* from Bolivia, *Paradisianthus neglectus* from Brazil, *P. micranthus* (*Zygopetalum micranthum* Barb. Rodr.) from Brazil, *Otostylis lepida* (*Aganisia nisia lepida* Lind. & Rchb. f.), *O. brachystalix* (*Zygopetalum brachystalix* Rchb. f.), and *O. venusta* (*Zygopetalum venustum* Ridl.).—*J. M. Greenman.*

1048. Schlechter, R. **Die Gattung Restrepia H. B. u. Kth. [The genus Restrepia HBK.]** Rep. Sp. Nov. **15**: 255–270. 1918.—**Barbosella,** a new genus, is proposed for a number of Central and South American orchids formerly included under *Restrepia.* The following combinations result: *Barbosella australis* (*Restrepia australis* Cogn.), *B. Cogniauxiana* (*Restrepia Cogniauxiana* Speg. & Kränzl.), *B. crassifolia* (*Restrepia crassifolia* Edwall), *B. cucullata* (*Restrepia cucullata* Ldl.), *B. Dusenii* (*Restrepia Dusenii* Sampaio), *B. Gardneri* (*Pleurothallus Gardneri* Ldl.), *B. Kegelii* (*Restrepia Kegelii* Rchb. f.), *B. Löfgrenii* (*Restrepia Löfgrenii* Cogn.), *B. microphylla* (*Restrepia microphylla* Rodr.), *B. Miersii* (*Pleurothallus Miersii* Ldl.), *B. Porschii* (*Restrepia Porschii* Kränzl.), *B. prorepens* (*Restrepia prorepens* Rchb. f.), *B. rhyncantha* (*Restrepia rhyncantha* Rchb. f. & Warsc.), *B. varicosa* (*Restrepia varicosa* Ldl.). The author also gives a synopsis of the genus *Restrepia* with critical notes on each of the 21 recognized species. Three new sectional names are given as follows: *Pleurothallopsis*, *Eurestrepia* and *Achaetochilus.* The new name *Pleurothallus Edwallii* Dusen & Schltr. (*Restrepia pleurothalloides* Cogn.) is proposed.—*E. B. Payson.*

1049. Schlechter, R. **Die Gattung Sigmatostalix Rchb. f.** [**The Genus Sigmatostalix Rchb. f.**] Rep. Sp. Nov. **15**: 139–148. 1918.—The species previously assigned to the genus *Sigmatostalix* are found to be very diverse structurally and from them have been segregated the new genera **Petalocentrum** and **Roezliella.** The three genera are compared critically and under each is given a key to the species properly assigned to them. Besides the new generic diagnoses the following species new to science and new combinations are included: *Petalocentrum pusillum* (*Sigmatostalix pusilla* Schltr.), *P angustifolium, Roezliella dilatata* (*Sigmatostalix dilatata* Richb. f.), *R. Wallisii* (*Sigmatostalix Wallisii* Rchb. f.), *R. reversa* (*Sigmatostalix reversa* Rchb. f.), *R. malleifera* (*Sigmatostalix malleifera* Rchb. f.), *R. Lehmanniana* (*Sigmatostalix Lehmanniana* Kränzl.), *Capanemia brachycion* (*Sigmatostalix brachycion* Griseb.), *C. Juergensiana* (*Rodriguezia Juergensiana* Kränzl.) and *C. pygmaea* (*Rodriguezia pygmaea* Kränzl.).—*E. B. Payson.*

1050. Schlechter, R. **Mitteilungen über einige europäische und mediterrane Orchideen. I.** [**Contributions concerning some European and Mediterranean Orchids. I.**] Rep. Sp. Nov. **15**: 273–302. 1918. [Rep. Eu. & Med. **1**: 274–302.]—I. The genera *Aceras, Himantoglossum* and *Anacamptis* are discussed in the light of their taxonomic history and present interpretation. Under each genus are listed the species and varieties belonging to it and critical notes are given. II. *Orchis persica*, a species new to science, is characterized. III. **Steveniella,** a new genus, is described and to it is referred 1 species, *S. satyrioides* (*Orchis satyrioides* Stev.). IV. *Gennaria* Parlat. is confirmed as worthy of generic rank. Specimens are cited for its single species, *G. diphylla* (Lk.) Parlat. V. *Platanthera parvula* is described as new to science.—*E. B. Payson.*

1051. Schlechter, R. **Odontioda × Fürstenbergiana Schltr., ein neuer bigenerischer Orchideenbastard.** [**Odontioda × Fürstenbergiana Schltr., a new bigeneric orchid-hybrid.**] Orchis **12**: 19, 20. 1918.—This new bigeneric hybrid is the result obtained from crossing *Cochlioda vulcanica* Benth. with *Odontoglossum Eduardi* Rchb. f.—*J. M. Greenman.*

1052. Schlechter, R. **Orchidaceae novae et criticae. Decas LI–LIII.** Rep. Sp. Nov. **15**: 193–209. 1918.—The following Guatemalan plants, chiefly from the collections of Bernoulli and Cario, are described as new to science: *Platanthera guatemalensis, Habenaria dipleura, H. latipetala, H. quinquefila, H. spithamaea, Pogonia debilis, Ponthieva pulchella, Pelexia guatemalensis, Spiranthes pulchra, Physurus humidicola, P. luniferus, P. trilobulatus, Microstylis acianthoides, M. lepanthiflora, Masdevallia guatemalensis, Stelis Bernoulii, S. Carioi, S. cleistogama, S. oxypetala, S. tenuissima, Pleurothallis Bernoullii, P. Carioi, P. lamprophylla, Epidendrum aberrans, E. lucidum, E. piestocaulos, E. verrucipes, Notylia guatemalensis, Leochilus major, Ornithocephalus tripterus.* Decas LIV. *ibid.* 210–217.—**Caloglossum,** a new genus of Madagascar orchids is described and to it are assigned the following new and transferred species: *C. flabellatum* (*Limodorum flabellatum* Thou.), *C. Humblotii* (*Cymbidium Humblotii* Rolfe), *C. magnificum, C. rhodochilum* (*Cymbidium rhodochilum* Rolfe). Additional new combinations in other genera are proposed as follows: *Platanthera Komarovii, Chloraea reticulata, Stelis ovatilabia, Dendrobium Casuarinae, Otostylis paludosa* (*Zygopetalum paludosum* Cogn.), *Oncidium Spegazzinianum* (*Leochilus Spegazzinianus* Kränzl.), *O. Waluewa* (*Waluewa pulchella* Regel), *Solenidium mattogrossense* (*Leochilus mattogrossensis* Cogn.), *Erycina diaphana* (*Oncidium diaphanum* Rchb. f.), *Pachyphyllum muscoides* (*Orchidotypus muscoides* Kränzl.), *P. cyrtophyllum* (*P. falcifolium* Schltr.).—*E. B. Payson.*

1053. Schlechter, R. **Orchidaceae novae et criticae. Decas LV–LVII.** Rep. Sp. Nov. **15**: 324–340. 1918.—The following new species and varieties of Madagascan orchids are described: *Benthamia elata, Habenaria Ferkoana, Cynosorchis diplorhyncha, C. Laggiarae, C. Laggiarae* var. *ecalcarata, Dispersis Afzelii, Goodyeara Afzelii, Platylepis margaritifera, Bulbophyllum Afzelii, B. brachyphyton, B. Ferkoanum, B. Laggiarae, B. melanopogon, B. mirificum, B. sarcorhachis, B. xanthobulbum, Lissochilus Laggiarae, Gussonea aurantiaca,*

Aerangis crassipes, A. pumilio, A. venusta, Jumellea cyrtoceras, J. Ferkoana, Angraecum conchoglossum, A. Ferkoanum, A. dasycarpum, A. Laggiarae, A. melanostictum, A. mirabile, A. sarcodanthum, A. tenuispica.—E. B. Payson.

1054. Schlechter, R. **Orchidaceae novae, in caldariis Horti Dahlemensis cultae. [New orchids cultivated in the Garden at Dahlem.]** Notizblatt Königl. Bot. Gart. Mus. Berlin 7: 268–280. Oct. 1, 1918.—The following new species of orchids are described: *Masdevallia paranaensis, Stelis diaphana, S. fragrans, S. Porschiana, S. robusta, S. thermophila, Pleurothallis lamproglossa, P. margaritifera, P. microblephara, P. mirabilis, P. paranaensis, P. Petersiana, P. rhabdosepala, Octomeria rhodoglossa, Encyclia laxa* native of Brazil, *Dendrobium dahlemense* from Sumatra, *Polystachya fulvilabia* from Kamerun, *Maxillaria phaeoglossa* and *M. xanthorhoda* native country unknown, and *Vanda Petersiana* from Burma.—*J. M. Greenman.*

1055. Schlechter, R. **Ueber einige neue Cymbidien. [On some new Cymbidiums.]** Orchis 12: 45–48. 1918.—The following new species and new hybrids are described: *Cymbidium Hennisianum* from *India, Cymbidium* × *Fürstenbergianum* (*C. Traceyanum* × *erythrostylum*), and *Cymbidium* × *magnificum* (*C. erythrostylum* × *Lowianum*).—*J. M. Greenman.*

1056. Schlechter, R. **Vanda × Herziana Schltr. n. hybr.** Orchis 12: 88, 89. 1918.—*Vanda* × *Herziana* is described as a new hybrid between *Vanda coerulea* and *V. suavis* Ldl.—*J. M. Greenman.*

1057. Schlechter, R. **Zwei neue Hybriden (Brassocattleya × Paulae Schltr. und Laeliocattleya × pulchella). [Two new hybrids.]** Orchis 12: 87. 1918.—*Brassocattleya* × *Paulae* was obtained by crossing *Cattleya aurea* with *Brassavola Perrinii* Rchb. f. and *Laeliocattleya* × *pulchella* was obtained by crossing the natural hybrid *Laelio* × *Crawshayana* with *Cattleya velutina* Rchb. f.—*J. M. Greenman.*

1058. Schneider, Camillo. **Weitere Beiträge zur Kenntnis der chinesischen Arten der Gattung Berberis (Euberberis). [Further contributions to the knowledge of the Chinese species of the genus Berberis (Euberberis).]** Oesterr. Bot. Zeitschr. 66: 313–326. 1916. *Ibid.* 67: 15–32, 135–146, 213–228, 284–300. 1918.—In this series of articles the author presents a revision of the Chinese species of *Berberis* recognizing 85 species and several varieties grouped in 10 sections. The following new species and new combinations are included: *Berberis phanera, B. Grodtmannia, B. Collettii, B. Willeana, B. Faberi, B. microtricha, B. Franchetiana, B. kansuensis, B. oritrepha, B. Wilsonae* Hensl. var. *subcaulialata* (*B. subcaulialata* Schn.), and *B. Wilsonae* Hemsl. var. *Stapfiana* (*B. vulgaris* var. *Stapfiana* Voss).—*J. M. Greenman.*

1059. Schulz, O. E. **Sisymbrium septulatum DC., eine bisher nicht genügend bekannte Art. [Sisymbrium septulatum DC., a species previously insufficiently known.]** Rep. Sp. Nov. 15: 369–372. 1918. [Rep. Eu. & Med. 1: 306–308.]—This species, described from incomplete material and confused by synonymy has been variously misinterpreted. A complete specific description is given and specimens are cited. The following new varieties are characterized: *S. septulatum* DC. var. *trichocarpum, S. septulatum* DC. var. *dasycarpum, S. septulatum* DC. var. *lasiocarpum.*—*E. B. Payson.*

1060. Small, James. **The origin and development of the Compositae.** *8vo. xi + 334 p., 6 pl., 79 text-fig.* William Wesley & Son: London, 1919. [Reprinted from the New Phytologist, Vols. xvi–xviii. 1917–1919.]—See Bot. Absts. 3, Entry 1142.

1061. Vierhapper, F. **Was ist Trifolium Pilczii Adamović? [What is Trifolium Pilczii Adamović?]** Oesterr. Bot. Zeitschr. 67: 252–264, 328–337. *Pl. 3.* 1918.—The author presents the results of a critical study of *Trifolium Pilczii* Adamovic, and discusses its relationship to *T. eximium* Steph. and *T. altaicum* Vierh.—*J. M. Greenman.*

1062. Viguier, R. **Les Araliacées cultivées.** [Cultivated Araliaceae.] Revue Horticole [Paris] **91**: 228–229. Feb., 1919.

1063. Viguier, R. **Les Araliacées cultivées.** [Cultivated Araliaceae.] Revue Horticole [Paris] **91**: 250–252. Mar., 1919.

1064. Von Wettstein, R. **Moltkea Dörfleri Wettstein und die Abgrenzung der Gattung Moltkea.** [Moltkea Dörfleri Wettstein and the demarcation of the genus Moltkea.] Oesterr. Bot. Zeitschr. **67**: 361–368. *Pl. 3, 22 fig.* 1918.—The author describes in detail and illustrates *Moltkea Dörfleri* Wettst., discusses the relationship of the genus *Moltkea* to allied genera, and enumerates with the bibliography and synonymy eight species recognized under the above generic name.—*J. M. Greenman.*

1065. Wagner, Rudolf. **Erläuterungen zu Plumiers Abbildung der Anechites lappulacea (Lam.) Miers.** [Explanations to Plumier's illustration of Anechites lappulacea (Lam.) Miers.] Oesterr. Bot. Zeitschr. **67**: 337–345. *3 fig.* 1918.

MISCELLANEOUS UNCLASSIFIED PUBLICATIONS

Burton E. Livingston, *Editor*

1066. Anonymous. **Palatability for sheep of certain New Zealand forest plants.** New Zealand Jour. Agric. **19**: 293–294. 1919.

1067. Anonymous. **Lac cultivation in India.** Sci. Amer. Supplem. **88**: 280. 1919. [From *Jour. Roy. Soc. of Arts.*]

1068. Anonymous. **Utilization of marine plants.** Sci. Amer. **121**: 557. 1919.

1069. Anonymous. **Peat fuel for locomotives.** Sci. Amer. **121**: 566. 1919.

1070. Baldwin, J. F. **Germination of grains.** Sci. Amer. **121**: 626. 1919.—Reports of germination of grains of cereals found wrapped up with ancient Egyptian mummies are claimed to be fictitious.—*Chas. H. Otis.*

1071. Bussy, P. **Le latanier du Sud-Annam et sa fibre.** [The Bourbon palm of southern annam and its fiber.] Bull. Agric. Inst. Sci. Saigon **1**: 377–380. 1919.—A discussion of the fibers produced by the palm *Corypha lecomtei* Becc.—*E. D. Merrill.*

1072. Caballero, A. **La Chara foetida A. Br., y las larvas de Stegomyia, Culex y Anopheles.** [Chara foetida A. Br. and the larvae of Stegomyia, Culex and Anopheles.] Bol. R. Soc. Española Hist. Nat. **19**: 449–455. Oct., 1919.—In the botanical laboratory of the University of Barcelona it was noticed that an aquarium containing *Chara foetida* appeared not to breed mosquitoes as did other aquaria containing other aquatics (*Potamogeton fluitans, P. pectinatus, Elodea canadensis,* and *Apium nodiflorum*). Experiments were undertaken which indicated that a sufficient quantity of *Chara foetida,* probably not much more than one-eighth of the total volume of the container, caused the death of mosquito larvae by asphyxiation. The larvae of *Stegomyia* appeared somewhat more resistant than those of the other genera. The cultivation of *Chara foetida* is stated to be easy and economical and its use in tanks, ponds, etc., is recommended for preventing the development therein of mosquito larvae.—*O. E. Jennings.*

1073. Clarkson, Edward Hale. **The irresistible charm of the ferns.** Amer. Fern Jour. **9**: 109–115. *Pl. 7–8.* 1919.

1074. Freund, Hans. **Ueber Kork-Ersatz.** [Substitutes for Cork.] Pharm. Zentralhalle Deutschland **60**: 183–187. 1919.—The scarcity of cork in Germany necessitated the use of substitutes for this commodity. The author describes the various barks, piths, etc., used for this purpose.—*H. Engelhardt.*

1075. FUEHNER, H. **Goldregen Tabak. [Cytisus laburnum tobacco.]** Pharm. Zentralhalle Deutschland **60**: 336–337. 1919.—The leaves of *Cytisus laburnum*, when subjected to proper fermentation, furnish a product which can be used as a substitute for tobacco. The smoke does not smell disagreeable, does not irritate the mucous membranes and acts on the central nervous system in exactly the same way as tobacco.—*H. Engelhardt.*

1076. GRIEBEL, C. **Beiträge zum mikroskopischen Nachweis von pflanzlichen Streckungsmitteln und Ersatzstoffen bei der Untersuchung der Nahrungs- u. Genussmittel. [Microscopical demonstration of vegetable substitutes in food investigation.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **38**: 129–141. 1919.—Histological description of substitutes for bread and meal, preserves, spices, and coffee.—*H. G. Barbour.*

1077. HABERLANDT, G. **Food value of alfalfa used as a table vegetable.** Sci. Amer. Supplem. **88**: 298, 312. 1919. [From *Die Naturwissenschaften* (Berlin).]

1078. HERTER, W. **Zur quantitativen Mikroanalyse der Nahrungs- und Futtermittel. [Quantitative micro-analysis of food.]** Zeitschr. Untersuch. Nahrungs- u. Genussmittel **38**: 65–82. 1919.—Thorough theoretical discussion with numerous examples.—*H. G. Barbour.*

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